Appendix F
U.S. Forest Service
Management Indicator Species Reports and
Wildlife Sensitive Species Analysis

In order for the U.S. Forest Service (USFS) to fully consider the impacts of the Boardman to Hemingway Transmission Project on management indicator species and wildlife sensitive species in the Wallowa-Whitman National Forest, the USFS required additional analysis for the Environmental Impact Statement analysis in Chapter 3. This analysis meets USFS regulations, policies, and objectives for management indicator species and sensitive species management.

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APPENDIX F1
U.S. FOREST SERVICE TERRESTRIAL MANAGEMENT SPECIES ANALYSIS

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BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT MANAGEMENT INDICATOR SPECIES (MIS)

WALLOWA-WHITMAN NATIONAL FOREST

Sept 2016

The Wallowa-Whitman National Forest Land and Resource Management Plan (LRMP) identifies five wildlife species, or groups of species, as MIS, or Management Indicator Species (U.S. Forest Service, 1990; Table 1). These species are identified because of their special habitat needs that may be influenced significantly by planned management activities, and as a result their populations can be used to indicate the health of a specific type of habitat. MIS species welfare can be used as an indicator of other species dependent upon similar habitat conditions. The following document provides context for each MIS species, existing conditions of each species within affected areas and an analysis of the direct and indirect effects of the B2H Project.

Table 1 - Wallowa-Whitman National Forest Management Indicator Species

Management Indicator Species	Habitat
Rocky mountain elk	Cover and forage, road density
American marten	Old growth and mature forest
Northern goshawk	Old growth and mature forest
Pileated woodpecker	Old growth and mature forest
Primary cavity excavators*	Snags and logs

*Northern flicker; black-backed, downy, hairy, Lewis', three-toed, and white-headed woodpeckers; red-naped and Williamson's sapsuckers; black-capped, and mountain chickadees; and pygmy, red-breasted, and white-breasted nuthatches

Rocky Mountain Elk

Rocky Mountain elk have been selected as an indicator of habitat diversity, interspersion of cover and forage area, and security habitat provided by areas of low human disturbance. Elk management on the Wallowa-Whitman National Forest is a cooperative effort between the Forest Service and the Oregon Department of Fish and Wildlife (ODFW). The Forest Service manages habitat while ODFW manages populations by setting seasons, harvest limits, and goals for individual Wildlife Management Units (WMU).

Potential elk habitat effectiveness may be evaluated using the Habitat Effectiveness Index (HEI; Thomas et al. 1988). This model considers the density of open roads, the availability of cover habitat, the distribution and juxtaposition of cover and forage across the landscape, and forage quantity and quality.

Background Information

Rocky Moutain elk (*Cervus canadensis nelson*- hereafter elk) are an important big game species in northeastern Oregon (Csuti et al. 2001) and are an indicator of the quality and diversity of forested habitat (defined as $\geq$ 40% canopy closure, USDA LRMP 1990) which includes an interspersion of cover and forage areas, and security habitat provided by cover and low levels of human activity (Thomas 1979). It is commonly accepted that the other big game species (i.e. mule deer, white-tailed deer, black bear, and cougar) are at least partially accommodated when high quality elk habitat is present. Elk are habitat generalists; they exploit a variety of habitat types in all successional stages and their patterns of use change daily and seasonally (Toweill

and Thomas 2002). Elk are quite responsive to land management activities, thus the density or health of elk populations (as opposed to examining population trends) most likely indicate the effectiveness of elk management. (Toweill and Thomas 2002).

Displacement of elk from areas during human activities (e.g. logging, fuels reduction) is well documented (Edge 1982, Toweill and Thomas 2002, Wisdom et al. 2005a). Under most cases, this displacement is temporary, and there is no evidence that elk will not eventually return to harvested areas (Toweill and Thomas 2002). Of much more concern to resource managers are the establishment of roads associated with management activities that increase accessibility to recreationists (e.g. hunter, hikers, cross country skiers, OHV). Increased road use by recreationists has been shown to significantly reduce elk security (Towill and Thomas 2002), increase stress levels (Creel et al. 2002), and increase elk vulnerability to mortality from both legal and illegal hunter harvest (Rowland et al. 2005).

Blue Mountain/WWNF Population Viability

The National Forest Management Act (1976) requires that habitat exist to provide for viable populations of all native and desires non-native vertebrates. Elk is a game species that is managed on a management objective (M.O.) basis. Management objectives were developed to consider not only the carrying capacity of the lands, but also the elk population size that would provide for all huntable surplus, and tolerance levels of ranchers, farmers, and other interests that may sometimes compete with elk for forage and space. Biologically, a population that is managed around a M.O. is much larger than a minimum viable population. A minimal viable population represents the smallest population size that can persist over the long term. Historically there were game species, including elk, which warranted serious conservation concerns due to depressed populations and range contractions resulting from unregulated market and sport hunting and loss of habitat. Many of the factors that contributed to the decline of large wild ungulates in the past do not exist today. Currently, elk populations on the WWNF are regulated by hunting and predation. Elk numbers are substantially higher than what would constitute a concern over species viability.

LRMP standards and guidelines

The FS land management allocations MA1, MA1 W, MA3, and MA3A emphasize timber production, but timber management is designed to provide near-optimum cover and forage conditions for big game. The LRMP gives big game standards by MA for cover, open road density, and habitat effectiveness (HEI) (Table 2).

Table 2 - Standards for big game habitat by MA (U.S. Forest Service 1990)

Habitat measure	MA 1	MA 1W	MA 3 (Winter Range)	MA 3W (Summer Range)
Cover[1]	≥ 30% cover	≥30% cover	No numerical standard in the LRMP, but it states "…to provide near-optimum cover and forage conditions for big game"[2]	No numerical standard in the LRMP, but it states "…to provide near-optimum cover and forage conditions for big game"[2]
HEI value	≥0.5	≥0.5	Long-term average of 0.74	Long-term average of 0.74
Open road density	≤ 2.5 mi/mi^2	≤1.5 mi/mi^2	≤1.5 mi/mi^2	≤1.5 mi/mi^2
Distribution of cover	N/A	N/A	At least 80% of the treated area that converts cover to forage is to be within 600 ft of a satisfactory cover patch at least 40 acres in size	At least 80% of the treated area is 1) w/in 600 feet of a satisfactory or marginal cover patch at least 6 acres in size and 2) w/in 900 feet of a satisfactory cover patch at least 40 acres in size

[1]Cover refers to any combination of satisfactory cover (a stand of coniferous trees with >70% canopy closure) and marginal cover (a stand of coniferous trees with 40-70% canopy closure). The optimum elk habitat ratio is approximately 40% cover to 60% forage (Thomas 1979).
[2]A ratio of 40% of a landscape in cover to 60% in forage approximates optimum habitat in the Blue Mountains (Thomas 1979). A "near-optimum" ratio would resemble the ≥ 30% cover standard for MA1 and 1W.

The watersheds are analyzed using a habitat effectiveness model (Thomas et al. 1988) to assess the quality of elk habitat. The HEI model evaluates size and spacing of cover and forage areas, density of open roads, quantity and quality of forage available to elk and cover quality. Forage data is unavailable and is not included in the total HEI value.

Cover: Forage Ratio – A cover: forage ratio is used to describe the relative amounts of cover to forage and while the optimal ratio of cover to forage is 40:60 (Thomas 1979), the LRMP establishes a minimum standard that at least 30% of forested land be maintained as cover (>40% canopy closure). "Forested land" refers to only those acres that currently provide forested cover or have the potential to provide it, not to grassland, shrub steppe, rock, or bodies of water. Cover refers to any combination of satisfactory cover (a stand of coniferous trees with >70% canopy closure) and marginal cover (a stand of coniferous trees with 40-70% canopy closure). Forage habitat has less than 40% canopy cover.

Cover Quality – Forests stands with relatively closed canopies function as thermal and security cover, providing a visual barrier from predators, and may reduce the effects of ambient temperature, wind, and long and short wave radiation functions on energy expenditure (i.e. increased metabolic rates) in elk. Although the benefits to elk of "thermal cover", in the true sense of the word, has been questioned (Cook et al. 1998, Bender and Cook 2005), the intent of the standard in managing elk habitat remains credible in that habitat attributes can be influential to energy balances by affecting forage quality and quantity, and mediating energy expenditures associated with travel and harassment (Bender and Cook 2005). By implementing the current "thermal cover" standard, resource managers are also providing needed barriers to minimize the negative effects of human disturbance.

Size and Spacing – Thomas et al. (1979) suggest that size and spacing of cover and forage habitat is a key to elk use of forested habitat, and this assumption was verified by Leckenby (1984) in

the Blue Mountains of northeastern Oregon. Size and spacing of habitat is considered optimal when cover to forage edge widths are between 100-200 yards (Thomas et al. 1988).

Open Roads – Excessive open road densities have deleterious effects on habitat effectiveness by taking land out of production (1 road mile equals 4 acres of land), reducing the effectiveness of cover and increasing disturbance to elk.

An important finding from the Starkey Experimental Forest and Range studies is that road (or route) density is not the best predictor of habitat effectiveness for elk. Instead, a method using distance bands proved to be a more useful tool for assessing effects from roads. Road densities do not provide a spatial depiction of how roads are distributed on the landscape (Rowland 2005), but a distance band analysis does. A distance band analysis uses GIS to draw concentric bands around motor vehicle routes until the entire area of interest (in this case the utility corridor and Timber Canyon Alternative analysis area) is occupied by these bands. The distance band closest to motor vehicle routes (within one half mile) provides the least security for elk. As a result, elk choose to spend less time within one half mile of motor vehicle routes. As distance from motor vehicle routes increases, so does habitat effectiveness for elk. Elk find more security from human disturbance further from motor vehicle routes. The second distance band occupies the area between on-half and one mile from motor vehicle routes, and represents moderate quality security habitat for elk. Effects from motor vehicles begin to dissipate within the second distance band. Finally, effects from roads are nearly negligible within the third distance band that occupies the area greater than one mile from motor vehicle routes. The third distance band represents high to optimal quality security habitat for elk. For this analysis, the percentage of the landscape within each distance band was used as a means of comparing the existing conditions to the proposed action with regard to the effects of motor vehicle disturbance to elk.

Habitat Effectiveness Index – The Habitat Effectiveness Index (HEI) values are based on a comprehensive elk habitat model developed by Thomas et al. (1988). These values consider the interaction of size and spacing of cover and forage areas, density of roads open to vehicular traffic, forage quantity and quality, and the quality of cover. For this report, HEI values were calculated without a forage quality value because accurate forage data is not available. Road values were calculated using the anticipated access roads; this analysis demonstrates the impacts of project activities on existing conditions. HEI values provide a watershed scale analysis of roads on the landscape and changes in the final access road miles is not anticipated to alter calculated HEI values.

Old Growth Habitat: American Marten, Northern Goshawk, and Pileated Woodpecker

Introduction

The American marten, northern goshawk, and pileated woodpecker are MIS of old growth habitat (U.S. Forest Service 1990). Old-growth habitat is categorized and analyzed in 2 categories according to the LRMP: 1) late old-growth structure; and 2) MA15 – Old-Growth Preservation. MA15 is a land allocation under the LRMP (U.S. Forest Service 1990) intended to

provide quality habitat for wildlife species associated with old growth characteristics. Old growth is a structural classification used to implement direction in the Forest Plan Amendment #2 (Screens; U.S. Forest Service 1995) and refers to multi-strata stands with large trees (Old Forest Multi-Stratum- OFMS) and single-stratum stands with large trees (Old Forest Single Strata- OFSS). Although the two terms have different administrative implications, both are intended to provide habitat for old growth associated wildlife species.

Old growth habitat and old growth management indicator species will be discussed separately below to provide an overview of old growth habitat in general within the project areas and at the landscape scale along with the effects of the proposed action on each of the species dependent on this habitat.

Wildlife habitat is commonly analyzed at the watershed scale because it provides a systematic way to understand and organize ecosystem information and thus enhances the ability to estimate direct, indirect, and cumulative effects of management activities (Regional Interagency Executive Committee 1995). However, the watershed scale may be too fine to analyze viability for wide-ranging species' unless it can be placed within the broader context of how the watershed contributes to overall species viability (Regional Interagency Executive Committee 1995).

Impacts to old growth dependent MIS species within the B2H project area were determined by analyzing effects to their habitat at several spatial scales starting with the watershed then framing that within the context of the Wallowa-Whitman National Forest (WWNF) and the Blue Mountains Ecological Province. These scales take into account the species' relationship with the landscape as well as being practical for management purposes. MIS population viability assessments have been conducted for American marten, pileated woodpecker, and northern goshawk at the Blue Mountains and WWNF. These assessments are incorporated by reference within the existing condition and effects analysis for each species. For more in-depth information on the methodology behind these assessments, please refer to the full-length assessments in the project record and the associated peer-reviewed literature scales (Penninger and Keown 2011a, Penninger and Keown 2011b, Penninger and Keown 2011c).

Old Growth Habitat

Background information

Regional Forester Amendment #2 of June 12, 1995 established interim riparian, ecosystem, and wildlife standards for timber sales (these standards are referred to as the "Eastside Screens"). The Eastside Screens require that a range of variation approach be used when comparing historical reference and current conditions, incorporating the best available science. The range of variation approach assumes that native species have evolved with the historical disturbance regimes of an area and so a forest will continue to sustain populations of those species if current conditions fall within the historic range of variation (Powell 2010). The following range of variation analysis uses methods described in Range of Variation Recommendations for Dry, Moist and Cold Forests (Powell 2010), which is now considered the best available science. Five forest structural stages are identified within these three potential vegetation groups; Stand Initiation (SI), Stem

Exclusion (SE), Understory Retention (UR) and Old Forest Single Stratum (OFSS) and Old Forest Multi Strata (OFMS).

LRMP standards and guidelines

The Regional Forester's Eastside Forest Plan Amendment #2 (Eastside Screens) contains standards and guidelines for old growth (U.S. Forest Service 1995). Standards and guidelines include maintaining all existing remnant late and old seral and/or structural live trees >21" dbh. According to the LRMP, areas allocated to MA15 have no scheduled timber harvest although salvage may occur following catastrophic destruction if more suitable replacement stands exist.

The Eastside Screens also provides direction for connectivity. Old growth stands are directed to be connected in a least two different directions by the shortest length, minimum 400 ft. wide corridor which maintains canopy cover in the upper one-third of the site potential.

Old Growth Management Indicator Species

The following gives background information and describes the existing forest level conditions of old growth management indicator species:

Section I – American Marten
Section II – Northern Goshawk
Section III – Pileated Woodpecker

I. American Marten (*Martes americana*)

Background information

The American marten (*Martes americana*, - hereafter marten*)* is associated with mature, mesic coniferous forests and is one of the most habitat-specialized mammals in North America (Bull and Heater 2001). Martens require complex physical structure in the forest understory created by lower branches of trees, shrubs and coarse woody debris (Buskirk and Ruggiero 1994, Witmer et al. 1998, Bull and Heater 2000). Marten in northeastern Oregon have been documented using large-diameter hollow trees and logs, accumulations of coarse woody debris, and trees with brooms for denning and resting sites (Bull and Heater 2000). 70% of martens in eastside mixed conifer forests used snags > 23.9 in dbh for denning and resting and downed wood > 20.7 in dbh for denning, resting and foraging (Mellen-Mclean et al. 2012).

Viability Determination

Wisdom et al. (2000) assessed broad-scale trends of 91 species in the interior Columbia Basin, including the marten. The historical estimate of source habitat for marten in the Blue Mountains was 8.83%, which increased to 23.5% by the 1990s. By managing habitat similar to historical conditions, it is assumed that remaining habitat will be adequate to ensure population viability because species survived those levels of habitat in the past to be present today (Landres et al. 1999).

Source habitat for marten was evaluated on the WWNF (Penninger and Keown 2011a) and represents the highest quality habitat which contributes to species viability. Source habitat for American marten is considered to be cold-moist and cold-dry forests with multi-stories, large tree structure and closed canopies. The threshold of ≥40% of the historical amount of source habitat in a watershed was used to identify watersheds with a relatively high amount of source habitat. Watersheds that contain ≥40% of the estimated historical median amount of source habitat are believed to provide for habitat distribution and connectivity, and better contribute to species viability across the forest. Not all watersheds on the WWNF have the potential to provide source habitat for marten; historically 76% of the watersheds provided source habitat and currently 68% of the watersheds provide source habitat. Although the viability outcomes for the current condition are lower than the historical, habitat is estimated to currently exist in the quality, quantity, and distribution capable of supporting a viable marten population at the WWNF scale.

II. Northern Goshawk

Background information

The Northern goshawk (*Accipiter gentilis*, hereafter goshawk) was chosen as a supporting indicator of abundance and distribution of mature and old-growth forests (LRMP 1990). The goshawk is associated with dense canopied mixed conifer, white fir, and lodgepole pine associations (Wisdom et al. 2000). Important habitat attributes of goshawk prey species include snags, down logs, woody debris, large trees, openings, herbaceous and shrubby understories, and an intermixture of various forest structural stages (Wisdom et al. 2000). Goshawks are prey generalists and use open understories below the forest canopy and along small forest opening to forage for mammals and small birds (Bull and Hohman 1994, Marshall 1992, Squires 2000).

Goshawks use broad landscapes that incorporate multiple spatial scales to meet their life requisites (Squires and Kennedy 2006). At least three levels of habitat scale are recognized during the breeding season: (1) a nest area, composed of one or more forest stands or alternate nests; (2) a post fledging area (PFA), which is an area around the nest used by adults and young from the time of fledging, when the young are still dependent on the adults for food, to independence; (3) a foraging area that comprises the breeding pairs entire home range (Reynolds et al. 1992, Reynolds 1983).

The nest area, or nest site, is the area immediately surrounding the nest tree, including the forest stand containing the nest tree. In general, goshawk nest areas are unique in structure, with large trees, dense and multiple canopies, and high canopy closure (>50%) primarily within mature and older forests with high amounts of down wood and snags (Finn 1994, McGrath et al. 2003).

The PFA surrounds the nest area and is defined as the area used by the family group from the time the young fledge until they are no longer dependent on the adults for food (up to two months) (Reynolds et al. 1992, Kennedy et al. 1994). PFAs generally have patches of dense trees, developed herbaceous and/or shrubby understories and habitat attributes (snags, down logs, small openings) that are critical for goshawk prey (Reynolds et al. 1992). The PFA is potentially important to the persistence of goshawk populations, as it may correspond to the area defended

by the breeding pair and provides fledgling hiding cover and foraging opportunities as fledglings learn to hunt.

Viability Determination

Throughout the Interior Columbia Bain, the amount of source habitat (i.e., habitat requirements to provide long term population persistence) available to the goshawk has declined from historical conditions. The greatest declines have occurred in the interior ponderosa pine and western larch forest types. It is estimated that there has been a 96% decline in old forest single-story ponderosa pine (Wisdom et al. 2000). However the interior Douglas-fir, grand fir, white fir, lodgepole pine, and juniper sagebrush have all increased in abundance from historical conditions. The overall decline in source habitat and strong decline in the ponderosa pine cover type is offset somewhat by increases in these other cover types and structural stages that provide source habitat.

Additional source habitat analysis was conducted at a finer scale on National Forest lands as part of a species viability assessment conducted in support of the Blue Mountains Forest Plan revision (Penninger and Keown 2011b). The threshold of $\geq$ 40% of the historical amount of source habitat in a watershed was used to identify watersheds with a relatively high amount of source habitat. Watersheds that contain $\geq$40% of the estimated historical median amount of source habitat are believed to provide for habitat distribution and connectivity, and better contribute to species viability across the forest. Thirty-two of the thirty-five watersheds on the WWNF which historically provided source habitat are above the historical median of source habitat providing 440,696 acres (94% of historical condition) of goshawk habitat. While the presence of roads and trails has decreased the habitat effectiveness of source habitat in most watersheds (67% in the low habitat effectiveness class) the majority of watersheds (86%) on the WWNF have high watershed index scores. High watershed index scores indicate good habitat abundance with low departure from historical conditions, and high habitat quality, with greater 50% of the source habitat being late-successional habitat.

The current viability outcome index for the WWNF show that current source habitat for the goshawk is slightly lower than for the entire Blue Mountains but is very near historical conditions, indicating that suitable habitats are broadly distributed and of high abundance, and the goshawk is likely well-distributed throughout the WWNF (Penninger and Keown 2011b).

LRMP Standards and guidelines- The Eastside Screens requires that all known and historically used goshawk nest-sites be protected from disturbance. An active nest is defined as a nest that has been used by goshawks within the past five years. Eastside Screens requires that a 30-acre buffer of the most suitable nesting habitat be established around every known active and historical nest tree(s), that it be deferred from harvest, and that a 400-acre post fledging area be established around every known active nest site. While harvest activities can occur within the PFA, up to 60% of the area should be retained in LOS conditions and harvest is to promote the development of LOS. Management of the PFA is intended to provide a diversity of forest conditions. Thinning from below with irregular spacing of leave trees would maintain the appropriate stand composition and structure. A seasonal restriction on logging in the PFA would be implemented during the nesting season from March 1 – September 30.

III. Pileated Woodpecker

Background Information

The pileated woodpecker (*Dryocopus pileatus*) occurs primarily in dense mixed-conifer forest in late seral stages or in deciduous tree stands in valley bottoms. It is occasionally seen in younger stands lacking large diameter trees, particularly in winter. It is rarely found in stands of pure ponderosa pine. The association with late seral stages stems from the need for large diameter snags or living trees with decay for nest and roost sites, large diameter trees and logs for foraging on ants and other arthropods, and a dense canopy to provide cover from predators (Marshall et al. 2003).

In northeast Oregon, the pileated woodpecker shows high selection for mature, unlogged grand fir stands with ≥60% canopy closure, multiple canopy layers, and high snag density (Bull and Meslow 1988, Bull 1987, Bull and Holthausen 1993). Bull et al. (2007) found that densities of nesting pairs of pileated woodpeckers were positively associated with the amount of late structural stage forest and negatively associated with the amount of area dominated by ponderosa pine and the amount of area with regeneration harvest. Although there is a preference for dense canopy stands, high tree mortality and loss of canopy closure in stands of grand fir and Douglas-fir did not appear to be detrimental to pileated woodpecker provided that large dead or live trees and logs were abundant and that stands were not subject to extensive harvest. Pileated woodpecker densities remained steady over 30 years in areas where canopy cover dropped below 60% due to tree mortality; older stands of grand fir and Douglas-fir consisting primarily of snags continued to function as nesting, roosting and foraging habitat for pileated woodpeckers. While closed canopy forests were not essential for use by pileated woodpeckers, nest success was higher in home ranges that had greater amounts of forested habitat with ≥60% canopy closure (Bull et al. 2007).

Pileated woodpeckers feed primarily on insects in dead wood in snags, logs, and naturally created stumps (Bull and Meslow 1988, Bull et al. 1986, Torgersen and Bull 1995). Based on research data compiled in the DecAID Wood Advisor (Mellen-Mclean et al. 2012) for eastside mixed conifer forests, 70% of pileated woodpeckers in the populations studied used snags > 12.9 in. dbh for foraging. Stands with high density of snags and logs were preferred for foraging (Bull and Meslow 1977).

Viability Determination

Habitat trends of the pileated woodpecker were assessed at the Interior Columbia Basin, Blue Mountains ecological reporting unit (ERU), and WWNF scales using information provided by Wisdom et al. (2000) and the species viability assessment conducted by Wales (2011) in support of the Blue Mountains Forest Plan revision.

A fine-scale analysis of source habitat on National Forest lands in the Blue Mountains, including the WWNF was conducted in 2011 (Penninger and Keown 2011c).This analysis indicated that there has been a decline in the amount of source habitat on the WWNF from historical conditions. However, source habitat of the pileated woodpecker is still available in adequate amounts and distribution to maintain pileated species viability on the WWNF. Currently, there

are approximately 206,374 acres (57% of historical condition) of source habitat on the WWNF, with twenty-nine of the thirty-five watersheds (83%) on the WWNF that historically provided source habitat, continuing to provide that habitat. Reductions of snags and the presence of roads has decreased the quality of source habitat in many watersheds but 33% of the watersheds on the WWNF have high watershed index scores, indicating good habitat abundance, moderate to high snag densities and low to moderate road densities. Additionally, 29% of the watersheds are in the moderate category. Watersheds having $\geq$ 40% of the median amount of source habitat are distributed across the WWNF and found in all clusters.

The viability assessment indicates the WWNF still provides for the viability of the pileated woodpecker. The pileated woodpecker is distributed across the WWNF and there are adequate amounts, quality, and distribution of habitat to provide for pileated woodpecker population viability.

Snag and Log Habitat: Primary Cavity Excavators (PCEs)

Background information

More than 80 species of wildlife use snags and living trees with defects (deformed limbs or bole, decay, hollow, or trees with brooms) in the interior Columbia River basin (Bull et al. 1997). The Blue Mountains of Oregon have 39 bird and 23 mammal species that use snags for nesting or shelter (Thomas 1979).

PCEs rely heavily on decadent trees, snags, and down woody material and can be used as an indicator species of snag habitat. These birds; common flicker (*Colaptes auratus*); Lewis' (*Melanerpes lewis*), hairy (*Picoides villosus*), downy (*Picoides pubescens*), white-headed (*Picoides albolarvatus*), black-backed (*Picoides arcticus*), three-toed (*Picoides tridactylus*), northern three-toed (*Picoides tridactylus bacatus*), and pileated (*Dryocopus pileatus*) woodpeckers; yellow-bellied (*Sphyrapicus varius*) and Williamson's sapsuckers (*Sphyrapicus thyroideus*); black-capped (*Parus atricapillus*), chestnut-backed (*Poecile rufescens*), and mountain chickadees (*Poecile gambeli*); and white-breasted (*Sitta carolinensis*), red-breasted (*Sitta Canadensis*), and pygmy (*Sitta pygmaea*) nuthatches, depend on snags for nesting and roosting, and snags and down wood for foraging. A key assumption is if habitat is provided for PCEs, then habitat requirements for secondary cavity users will be met. Suitable nest sites are often considered the limiting factor for cavity nesting bird populations.

Many PCEs, and secondary cavity nesters, feed on forest insects and play a vital role in maintaining healthy, productive forests. Large snags and trees provide more functions, for more species, for a greater period of time than smaller ones. Large woody structures are not easily or quickly replaced. Down woody material is an important component of the forest ecosystem because of its role in nutrient cycling and immobilization, soil productivity, and water retention (Johnson and O'Neil 2001). It also provides habitat for mycorrhyzal fungi, invertebrates, reptiles, amphibians, and small mammals. For these reasons emphasis should be placed on conserving or creating these structures when carrying out forest management practices. There is

increasing pressure on snag and log habitat as logging safety restrictions and firewood gathering intensify.

LRMP standards

LRMP direction is to maintain snags and green tree replacement trees of ≥21 inches dbh, or whatever is the representative diameter of the overstory layer if it is <21 inches dbh, at 100% potential population levels of primary cavity excavators (U.S. Forest Service 1995). The LRMP used information from Wildlife Habitats in Managed Forests (Thomas et al. 1979; at least 2.25 snags >20 in dbh per acre) to establish minimum snag guidelines. The model Thomas et al. (1979) used to generate snag densities addressed snags for roosting and nesting, but did not consider snags for foraging, and was never scientifically validated. More recently, several studies have shown these snag densities are too low to meet the needs of many primary and secondary cavity users (Bull et al. 1997, Harrod et al. 1998, Korol et al. 2002). Consequently, the original standards for snags and down wood from Thomas et al. (1979) were replaced with the Regional Forester's Forest Plan Amendment #2 (U.S. Forest Service 1995). Bull et al. (1997) found the 2.25 snags/acre insufficient and that 4 snags/acre (2.8 are between 10-20 inches dbh and 1.2 are >20 inches dbh) is more appropriate as a minimum density required by primary and secondary cavity users for roosting, nesting, and foraging needs. Harrod et al. (1998) determined a range of historic snag densities for dry eastside forests between 5.9-14.1 snags/acre (5-12 are between 10-20 inches dbh and 0.9 to 2.1 are >20 inches dbh). Korol et al. (2002) determined that HRV for large snags (20 inches dbh) for dry eastside mixed conifer forest with a low intensity fire regime was 2.9 to 5.4 snags/acre.

Direction from the Eastside Screens requires that pre-activity levels of logs be left unless those levels exceed those shown in Table 12. Live green trees of adequate size must also be retained to provide replacements for snags and logs through time. Generally green tree replacements (GTRs) need to be retained at a rate of 25 to 45 trees per acre, depending on biophysical group. Pre-activity levels of logs should also be left unless levels exceed amounts specified in Eastside Screens (U.S. Forest Service 1995; Table 3). Larger blowdowns with intact tops and root wads are preferred to shorter sections of tree boles.

Table 3 - LRMP standards for down wood[1] (U.S. Forest Service 1995)

Stand type	Pieces/acre[1]	Piece length	Diameter small end	Linear ft/acre
Ponderosa Pine	3-6	> 6`	12``	40`
Mixed conifer	15-20	> 6`	12``	140`
Lodgepole Pine	15-20	> 8`	8``	260`

[1]The table converts to about 0.4, 1.7, and 3.3 tons/acre for ponderosa pine, mixed conifer, and lodgepole pine

The Decayed Wood Advisor (DecAID)

Integration of the latest science is incorporated into this analysis using DecAID Advisor (version 2.2) (Mellen-McLean et al. 2012) which is an internet-based summary, synthesis, and integration (a "meta-analysis") of the best available science: published scientific literature, research data, wildlife databases, forest inventory databases, and expert judgment and experience. In addition

to data showing wildlife use of dead wood, DecAID also contains data showing amounts and sizes of dead wood across the landscape based on vegetation inventory data.

Data from unharvested plots are assessed separately and these data can be used as a reference condition to approximate HRV of dead wood. There is debate among professionals on the impact fire exclusion has on stands relative to HRV of dead wood. One caveat to using these data is, "On the eastside in particular, current levels of dead wood may be elevated above historical conditions due to fire suppression and increased mortality, and may be depleted below historical levels in local areas burned by intense fire or subjected to repeated salvage and firewood cutting" (Mellen-McLean et al. 2012). Even with this caveat, the data are used in this analysis because: they are still some of the best data available to assess HRV of dead wood, even in eastside dry forests; they are the only available data showing distribution and variation in snag and down wood amounts across the landscape; the data from unharvested stands are in the range of other published data on HRV of dead wood even in the drier vegetation types. For a full discussion see HRV Dead Wood Comparison (Mellen-McLean 2011).

Existing Condition and Direct/Indirect Effects: Segment 1 and 2 Utility Corridor

The following outlines the existing conditions and direct/indirect effects for Wallowa-Whitman Management Indicator Species within the Utility Corridor in Segments 1 and 2. Cumulative effects are discussed within the EIS Section 3.3. Portions of Segment 1 and Segment 2 cross 5.6 miles of Forest Service land. Alternative routes and route variations in Segments 1 and 2 fall within the MA-17 Utility Corridor. The analysis is conducted on Segment 1, Link 1-77 (S1-B1) and Segment 2, Links 2-1, 2-3 and 2-7 (S2-A2). These links were identified in a GIS exercise as intercepting more old growth acres compared to other route variations within MA-17. Additionally, the analysis for old growth structure and old growth dependent species was run using a conservative approach of 500ft buffer as opposed to the 250 ft clearing that would actually be created by project activities. The transmission line has the potential to shift during construction because of micro site issues so by expanding the analysis to look at a 500ft buffer, it takes into account all habitat that could be affected. The analysis below represents the maximum potential impacts of the B2H project. The area of analysis (500ft buffer) is hereafter referred to as the utility corridor.

Existing Condition: Utility Corridor

The utility corridor crosses 408 linear acres of Forest Service land located within Township 2S, Range 36E, Sections 7, 17, 20, 21, 28, 27 and 26. The proposed location of the utility corridor runs parallel to Highway 84 and a variation of the corridor is co-located with an existing BPA powerline (a portion of the co-located variation is included in the analysis). Existing disturbances in the direct vicinity of the proposed utility corridor include two high traffic recreation areas (Oregon Trail Interpretive Park and Spring Creek Recreation Area), a major highway exit to access these recreation areas, an existing powerline, access roads to the powerline, and high cross country OHV use. Additionally, because of this areas close proximity to La Grande and

gentle topography, woodcutting and mushroom hunting occur in high volumes during their respective seasons. One main assumption within this analysis, for all MIS species, is that this area does not represent high quality habitat because existing high levels of human disturbance throughout the year.

I. Rocky Mountain Elk

Existing Condition

The B2H Alternatives and Variations within MA17 (Power Transportation Facility Retention) falls within the Starkey (ODFW) hunting unit. Elk populations in this unit increased from about 7,500 in the late 1960's to about 19,000 in the mid-1970's. Populations have remained between 15,000 and 20,000 ever since. The Starkey unit has remained fairly stable over the years. In 2016, elk numbers were about 100% of the management objective of 17,100.

The watersheds containing the proposed action (Beaver Creek-Grande Ronde and Five Points-Grande Ronde watersheds 5th HUC) were analyzed using a habitat effectiveness model (Thomas et al. 1988) to assess the quality of elk habitat. The HEI model evaluates size and spacing of cover and forage areas, density of open roads, quantity and quality of forage available to elk and cover quality. Forage data is unavailable and is not included in the total HEI value.

Cover: Forage Ratio- The existing cover: forage ratio is 54:46. This ratio exceeds the LRMP standard, suggesting a higher surplus of cover, however stand data was collected in the early 80's and the ratio may misrepresent the analysis area based on changed conditions due to natural disturbances over time.

Size and Spacing- The corresponding HEI value for size and spacing is 0.75 (Table 4) Considering an HE value of 1 is optimal, 0.75 indicates that forage to cover ratios within the analysis area is less than optimal, but acceptable. However, this variable is not meant to stand alone and therefore management decisions for providing optimum elk habitat solely based on HE size and spacing value should be used with caution.

Cover Quality- The Wallowa-Whitman LRMP establishes a minimum standard for big game thermal cover (marginal and satisfactory combines). At least 30% of the forested lands should be maintained in a thermal cover condition. All Management Areas were pooled for analysis, because they have the same cover standard, thus providing for a more landscape-scale based approach. There are currently 18.8% of the lands are in satisfactory cover, 34.8% of marginal cover and 46% of forage habitat within the analysis area resulting in a cover quality value of 0.69 (Table 4).

Open Roads – Excessive open road densities have deleterious effects on habitat effectiveness by taking land out of production (1 road mile equals 4 acres of land), reducing the effectiveness of cover and increasing disturbance to elk. The existing average open road density within the watersheds analysis area is 1.51 mi/mi^2 (Table 3). These average open road density is lower than the forest plan guideline of 2.5mi/mi^2 for MA-1. However, the road density estimate does not take into account off-road vehicle use on OHV trails, cross-country travel and on closed roads.

When these variables are taken into account, road density estimates are likely to be higher. The corresponding HEI value for road densities is 0.54.

Distance band analysis- The distance band analysis found that 58% of the landscape falls within on half mile of a motor vehicle route. 16% falls within the second distance band and represents the amount of landscape where the effects of motor vehicles start to dissipate. 26% of the landscape occurs within the third distance band and represents the amount of high to optimal quality security habitat for elk. The corresponding HEI value for the distance band analysis is 0.55.

Table 4 - Habitat-effectiveness index calculations for existing conditions within the Utility Corridor analysis area

Habitat Effectiveness Variable	Habitat Effectiveness Value (Optimal = 1.0)	Comments
HE Cover	0.69	Amount of satisfactory cover relative to marginal cover
HE Size and Spacing	0.75	Mosaic of cover and forage, 49:51
HE r value using road density	0.54	Open road density 1.51 mi/mi sq
HE r value using distance bands	0.55	Concentric bands around open roads
Total HEI using road density[1]	**0.67**	Forest guideline ≥ 0.5 HEI
Total HEI using distance band analysis*	**0.67**	Forest guideline ≥ 0.5 HEI
Percent of area ≥0.90 mi from open motorized route*	26%	High quality security habitat

[1]HEI calculations do not include a forage variable because current, reliable forage data are not available
*Habitat <0.90 mi from an open motorized route is considered marginal or poor

Direct/Indirect Effects- Road values were calculated using the anticipated access roads understanding that final access roads may differ slightly from original estimates. This analysis is intended to demonstrate the impacts of project activities on existing conditions. HEI values provide a watershed scale analysis of roads on the landscape and so variations in anticipated access roads at the scale of the project would not be large enough to change calculated HEI values.

Direct

Direct effects to elk from the utility corridor would be the disturbance associated with increased human activity. Noise, visual disturbance, and increased human traffic related to construction activities are likely to displace elk from the area for the duration of the disturbance. A section of the co-located variation occurs within a big game winter range closure on the WAW and construction activities may displace elk. Displacement during this time could affect over-winter survival by causing animals to mobilize stored bodily energy reserves that are needed to survive the winter when food is scarce. Implementing timing restrictions can mitigate this effect and waivers from the Forest Service are needed to access this particular area during the winter.

Indirect

Cover: Forage- Project activities within the utility corridor would clear 408 linear acres of vegetation and maintain the land in a state of forage. Existing conditions show a surplus of marginal cover and while this alternative would create more forage on the landscape, the disturbance associated with powerlines would likely reduce the benefit in the short-term. Cover: forage ratios would remain the same across the majority of the watersheds and the minimal increase would not affect elk distribution. Project activities does not change the cover: forage or size and spacing HEI values (Table 5)

Roads: The utility corridor would increase road density from 1.51 mi/mi^2 to 1.55 mi/mi$^{2.}$ The amount of high quality security within the watersheds would decrease from 26% to 25%. These additional roads are exclusively construction or maintenance access roads and would not be open to the public, however the ability to restrict traffic may be limited and it can be assumed that there will be an increase in disturbance outside of the times they are used for maintenance. Because of this these roads were analyzed as "open" roads and the numbers represent the highest level of disturbance that would occur. Disturbance from roads can affect elk distribution and in areas of high road densities elk exhibit higher levels of stress and increased movement rates (Wisdom 2005). A portion of the proposed utility line would intercept a designated Wallowa-Whitman big game winter range, and though the area is closed to the public from November 15-April 30th, any increase in roads increases the potential for disturbance. However, because of existing disturbance that is currently influencing elk distribution, it is unlikely that the proposed action will change the way that elk utilize habitat in the area. The change in road density does not affect the overall habitat effectiveness value at the landscape level. (Table 5).

Table 5 - Habitat-effectiveness index calculations for the proposed action within the Utility Corridor analysis area

Habitat Effectiveness Variable	Habitat Effectiveness Value (Optimal = 1.0)	Comments
HE Cover	0.69	Amount of satisfactory cover relative to marginal cover
HE Size and Spacing	0.75	Mosaic of cover and forage, 49:51
HE r value using road density	0.53	Open road density 1.55 mi/mi sq
HE r value using distance bands	0.55	Concentric bands around open roads
Total HEI using road density[1]	0.67	LRMP guideline ≥ 0.5 HEI
Total HEI using distance band analysis*	0.67	Forest guideline ≥ 0.5 HEI
Percent of area ≥0.90 mi from open motorized route*	25%	High quality security habitat

[1]HEI calculations do not include a forage variable because current, reliable forage data are not available
*Habitat <0.90 mi from an open motorized route is considered marginal or poor

II. Old Growth

Existing Condition

The utility corridor passes through the Five Points- Grande Ronde River and Beaver Creek-Grande Ronde watershed (5th HUC). Both watersheds are below the historic range of variation (HRV) for all Old Forest Single Stratum (OFSS) potential vegetation groups (dry, moist, cold) and below HRV for Old Forest Multi Stratum (OFMS) within the moist upland potential vegetation group. Both watersheds are within HRV for Old Forest Multi Stratum (OFMS) within the dry and cold potential vegetation groups. The analysis area contains 34 acres of dry OFMS. Designated old growth (MA-15) occurs within the watershed, but not within the utility corridor.

Direct/Indirect Effects

Old growth- Project activities associated with the utility corridor would directly affect 34 acres of old growth habitat. The structure stage would change to stand initiation and would remain in an early seral stage for the lifetime of the power line. The reduction in old growth would occur in dry OFMS, a structure stage that is within HRV within the watersheds. Because the transmission line would affect few old growth acres HRV would not be affected.

Connectivity- Connectivity is important to ensuring population persistence, species interactions and ecosystem processes. Projects like roads, highways and utility corridors can fragment continuous habitat patches resulting in smaller patch sizes and higher edge to interior ratios, resulting in an impact that is disproportionate to the area of land that they occupy. Smaller overall patch size may result in the loss of area-sensitive wildlife. The proposed location of the utility corridor runs parallel to a major highway and an existing powerline. The current conditions of the analysis area indicate low connectivity levels. The utility corridor would continue to fragment and reduce connectivity in this area, however the effect would be minimal in the context of the watershed.

III. American Marten

Existing Condition

Five Points- Grande Ronde River

The utility corridor runs along the far western edge of the Five Points- Grande Ronde river watershed (5th HUC). This watershed contains 2,322 acres of identified source habitat (habitat that can support a stable or increasing population of marten) out of 16,186 (14%) potential acres of marten habitat. The current watershed index is 2.02 with the historic watershed index at 2.78, indicating a high historic level of habitat quality and a current medium level of habitat quality and quantity. This watershed currently provides $\geq$ 40% of the median amount of source habitat that occurred historically, and is above the threshold necessary to support marten population viability (Penninger and Keowen 2011a). The majority of the source habitat is found in the northeastern part of the watershed where it is more remote, with lower road densities and contains more cold-upland habitat. The western edge is predominantly dry forest and does not contain much identified source habitat.

Grande Ronde River- Beaver Creek

The utility corridor runs along the north eastern edge of the Grande Ronde River-Beaver Creek watershed. This watershed contains 2,399 existing acres of marten source habitat (habitat that can support a stable or increasing population of marten) out of 33,101 (7%) potential acres of marten habitat. The current watershed index is 0.63 with the historic watershed index at 2.64, indicating a high historic level of habitat quality and a current lower level of habitat quality and quantity. This watershed currently does not provide ≥ 40% of the median amount of source habitat that occurred historically, and is not above the threshold necessary to support marten population viability (Penninger and Keowen 2011a). This does not preclude marten from using the area as secondary habitat (hunting and traveling) but indicates that the majority of the habitat is not suitable for denning.

Direct/Indirect Effects

The combination of warm, dry forest types, early seral stages, and high levels of disturbance and fragmentation in the area surrounding the utility corridor makes this area unlikely to support a population of marten. GIS analysis identifies 0.33 acres of marten denning/source habitat that directly intersect the utility corridor and would directly affected through habitat removal. Project activities have the potential to indirectly render the entire stand (outside of the area directly intersected by the utility corridor) unusable as denning habitat due to disturbance from project activities in the short term and an increase in fragmentation, smaller patch size and reduced connectivity in the long term. When considering the remainder of the stands indirectly impacted by project activities, the utility corridor would affect 2.18 acres of marten source habitat.

Viability

Taking the surrounding unsuitable habitat into context, the proposed action would have no impact on marten denning and reproduction and would have minimal impact on marten foraging and traveling. Existing marten source habitat on the WWNF as modeled by Wales (2011) totals 129,943 acres. As a result of proposed activities under the utility corridor, source habitats across the forest would decline by less than 0.5% would not be affected. Cluster analysis used to describe existing distribution of source habitats across the WWNF indicates that these habitats are well distributed across the forest (Penninger and Keown 2011a). Post treatment availability of source habitat would continue to exceed the threshold of 40% of the historical amount in the watersheds and will continue to contribute to habitat distribution and species viability on the WWNF. There will be no decrease in habitat quality at the scale of the WWNF.

IV. Northern Goshawk

Existing Condition

Five Points- Grande Ronde River

The utility corridor runs along the far western edge of the Five Points- Grande Ronde river watershed (5th HUC). This watershed contains 9,058 acres of identified source habitat (habitat

that can support a stable or increasing population of goshawks) out of 27,019 (34%) potential acres of goshawk habitat. The current watershed index is 2.55 with the historic watershed index at 2.94, indicating a high historic level of habitat quality and a current high level of habitat quality and quantity. This watershed currently provides ≥ 40% of the median amount of source habitat that occurred historically, and is above the threshold necessary to support goshawk population viability (Penninger and Keowen 2011b). Habitat is scattered across the watershed, including in the area of the proposed action.

Grande Ronde River- Beaver Creek

The utility corridor runs along the north eastern edge of the Grande Ronde River-Beaver Creek watershed. This watershed contains 7,956 existing acres of goshawk source habitat (habitat that can support a stable or increasing population of goshawks) out of 53,051 (15%) potential acres of marten habitat. The current watershed index is 2.48 with the historic watershed index at 2.94, indicating a high historic level of habitat quality and a current high level of habitat quality and quantity. This watershed currently provides ≥ 40% of the median amount of source habitat that occurred historically, and is above the threshold necessary to support goshawk population viability (Penninger and Keowen 2011b). Habitat is scattered across the watershed, including in the area of the utility corridor.

Direct/Indirect Effects

The utility corridor would directly impact 43 acres of goshawk source habitat. Affected acres would be cleared of vegetation and maintained in a non-forested condition. They would no longer serve as source habitat and disturbance from access roads could preclude goshawks from nesting in the near vicinity. Project activities have the potential to indirectly render the entire stand (outside of the area directly intersected by the utility corridor) unusable as nesting habitat due to disturbance from project activities in the short term and an increase in fragmentation, smaller patch size and reduced connectivity in the long term.. When considering the remainder of the stands directly impacted by project activities, the utility corridor would affect 183 acres of goshawk source habitat. The utility corridor could also be a deterrent to dispersal between watersheds.

No active or historical (nests found within the past 5 years) are known in the area, however surveys conducted from the early 1990's to the early 2000's found nests to be well distributed within the affected watersheds. Goshawk surveys will be conducted before project activities occur. Any active nests during the time of construction will be protected with timing restrictions. However, the 30 acre no treatment buffer required by Eastside Screens would not be maintained. After birds have fledged, habitat would be removed for transmission line activities.

Viability

Taking into consideration the presence of a major highway in the vicinity of the proposed action along with existing levels of fragmentation, the area of the proposed action does not have high nesting or dispersal potential. Existing goshawk source habitat on the WWNF, as modeled by Wales (2011), totals 440,696 acres. As a result of projected habitat reduction by the utility corridor, source habitats at the Forest-level would decline by less than 0.5%. Cluster analysis

used to describe existing distribution of source habitats across the WWNF indicates that these habitats are well distributed across the Forest (Penninger and Keown 2011).

Because this project impacts less than 0.5% of source habitat across the Forest, the overall direct and indirect effects will result in no effect to goshawk habitat. The loss of habitat will be insignificant at the scale of the WWNF. Post-treatment availability of source habitats would continue to exceed the threshold of 40% of the historical amount in the Grande Ronde River/Beaver Creek and Five Points- Grande Ronde watersheds, thereby continuing to contribute to habitat distribution and species viability on the WWNF.

V. Pileated Woodpecker

Existing condition

Five Points- Grande Ronde River

The utility corridor runs along the far western edge of the Five Points- Grande Ronde river watershed (5^{th} HUC). This watershed contains 2,910 existing acres of source habitat out of 25,411 (11%) potential acres of source habitat (habitat that can support a stable or increasing population of pileated woodpeckers). The current watershed index is 1.86 and the historic watershed index is 2.63 indicating a moderate level of habitat quality now and a high level of habitat quality historically. This watershed currently provides ≥ 40% of the median amount of source habitat that occurred historically, which is above the threshold necessary to support pileated woodpecker population viability (Penninger and Keown 2011c). The estimated number of breeding pairs this watershed can support based on acres of source habitat is 3.8.

Grande Ronde River- Beaver Creek

The utility corridor runs along the north eastern edge of the Grande Ronde River-Beaver Creek watershed. This watershed contains 3,266 existing acres of pileated source habitat (habitat that can support a stable or increasing population of pileated) out of 48,697 (7%) potential acres of marten habitat. The current watershed index is 2.48 with the historic watershed index at 2.94, indicating a high historic level of habitat quality and a current high level of habitat quality and quantity. This watershed currently provides $\geq$ 40% of the median amount of source habitat that occurred historically, and is above the threshold necessary to support pileated population viability (Penninger and Keowen 2011c). Habitat is scattered across the watershed, including in the area of the proposed action.

Direct/Indirect Effects

No acres of identified pileated source habitat would be affected by project activities associated with the utility corridor. Project activities would remove trees from the landscape and maintain it in a non-forested condition. Any existing snags would be removed, and this area would not contribute to future snags. Lack of canopy cover and lack of snags would preclude this area from becoming pileated woodpecker habitat. Due to current levels of disturbance the area of the utility corridor does not have high nesting or dispersal potential.

Viability

Existing pileated woodpecker source habitat on the WWNF as modeled by Wales (2011) totals 129,943. As a result of the utility corridor, no pileated source habitat across the forest would be impacted in the medium term (30-50 years). Cluster analysis is used to describe existing distribution of source habitats across the WWNF and indicate that these habitats are well distributed across the Forest (Penninger and Keown 2011c).

Because this project doesn't affect suitable habitat across the Forest, the overall direct and indirect effects will result in a small negative effect to pileated woodpecker habitat. The loss of habitat will be insignificant at the scale of the WWNF. Post-treatment availability of source habitats would continue to exceed the threshold of 40% of the historical amount in the Grande Ronde-Beaver Creek and Grande Ronde-Five Points watersheds thereby continuing to contribute to habitat distribution and species viability on the WWNF.

VI. Primary Cavity Excavators

Existing Condition

Existing conditions for snag and log habitat are based on analysis done for the Trail Vegetation Management Project (2012) which covers the same watersheds as the utility corridor. No large fire, insect or disease events have happened within the watersheds that would have dramatically changed snag and log conditions in the past 4 years. Within these watersheds, based on field reconnaissance (summer/fall 2011-2012), snag levels were generally between 1-6 snags per acre (10-21 + inch diameter and > 20 feet tall), dependent on stand composition. Although past logging has reduced snags in past regeneration harvest units, other areas (especially grand fir dominated stands) show an increase in snags due to past insect and disease outbreaks.

Down wood in all size classes (0 - 0.25 in, 0.25 - 1 in, and > 3 in) is common throughout the Five Points Creek-Grande Ronde River and Grande Ronde River-Beaver Creek Watershed, therefore the total volume of down wood exceeds LRMP standards. Within the watersheds the cold upland forest types contain (< 30 tons/acre fuel loads), the dry upland forest types contain (< 20 tons/acre fuel loads), and the moist upland forest types contain (>30 tons/acre fuel loads).

The habitat categories from DecAID that most closely reflect conditions in the utility corridor area are the "Small/medium tree" structural conditions within the "Eastside Mixed Conifer Forests, East Cascades/Blue Mountains" and "Small/medium tree" structural conditions in "Ponderosa Pine/Douglas-fir Forest" wildlife habitat descriptions. DecAID synthesized data for wildlife use of snag densities, by a representative sample of PCEs possibly found within the analysis area, are given below (Table 6). Effects are discussed in terms of snag densities with and without the proposed treatments, and how those densities relate to tolerance levels for wildlife species that utilize snags. The information is presented at three statistical tolerance levels which may be interpreted as three levels of "assurance": low (30% TL), moderate (50% TL) and high (80% TL). Each tolerance level is the amount of assurance a land manager would have that they

are meeting the habitat needs of the specific species (e.g., 0.3 snags per acre <10 inches dbh would provide a 30% assurance of meeting habitat needs for white headed woodpeckers).

Table 6 - DecAID synthesized data for wildlife use of snag densities for ponderosa pine/Douglas-fir habitat type and small/medium trees and larger trees structural condition classes (PPDF_S/L)

	Snags > 10 in dbh			Snags > 20 in dbh		
	30% TL[1]	50% TL	80% TL	30% TL	50% TL	80% TL
Species	Snag density (#/acre)	Snag density (#/acre)	Snag density (#/acre)	Snag density (#/acre)	Snag density (#/acre)	Snag density (#/acre)
White-headed woodpecker	0.3	1.7	3.7	0.5	1.8	3.8
Pygmy nuthatch	1.1	5.6	12.1	0.0	1.6	4.0
Black-backed woodpecker	2.5	13.6	29.2	0.0	1.4	5.7
Williamson's sapsucker	14.0	28.4	49.7	3.3	8.6	16.6
Pileated woodpecker	14.9	30.1	49.3	3.5	7.8	18.4

[1]TL = Tolerance level.

Existing snag densities (< 20in dbh, Table 7) were compared to wildlife tolerance levels (Table 6). For white-headed woodpeckers, snag density estimates are between the 50% and 80% TL for snags >10 in dbh and snags > 20 in dbh in dry and upland forest and at 80% TL for all snags >10 dbh in the cold upland forest. For pygmy nuthatches, snag densities are between the 30% and 50% TL for snags >10 in dbh and snags > 20 in dbh in all in dry and upland forest and at 80% TL for snags >10 dbh in the cold upland forest. For black-backed woodpeckers, snag densities are below 30% and 50% TLs for snags >10 in dbh and between 30%-50% TLs for snags > 20 in dbh in dry and upland forest and at 30% TL for snags >10 dbh in the cold upland forest. For Williamson's sapsucker and the pileated woodpecker, snag densities are well below the 30% TL for snags >10 in dbh and around 30% TL for snags > 20 in dbh for all potential vegetation groups. The studies used in DecAID to derive this data are largely from NE Oregon and are applicable to the project area. At the existing snag densities and sizes, Wiliamson's sapsuckers and pileated woodpeckers will not use the majority of the project area for nesting, roosting, or foraging. These birds need areas with snag densities much higher than those in the project area. Historically, white-headed woodpeckers probably used most of the lower elevation areas within the analysis area. Source habitats for low-elevation old-forest species have declined more than any other habitat type from historical to current conditions and populations of white-headed woodpeckers have declined strongly along with this loss of habitat (Wisdom et al. 2000). Retention of downed logs is based on Amendment #2. DecAID provides estimates of percent cover of downed wood. The existing down wood data is in tons per acre. A direct conversion to percent cover tolerance levels is not possible without the length of the logs and diameter, and this data is not available. However, estimates of post project down wood exceed LRMP standards.

Direct/Indirect Effects

Within the analysis area the utility corridor action would directly impact 408 acres of Forest Service land. Project activities would remove trees from the landscape and maintain it in a non-forested condition. Any existing snags would be removed, and this area would not contribute to

future snags. Project activities will also add access roads to the landscape, which could lead to an increase is snag loss due to firewood cutting though the effects are difficult to quantify. Access roads are intended to be closed to the public, however enforcement is difficult and some degree of public use can be expected.

Project activities would permanently remove any existing snags as well as the possibility of future snag recruitment in the area of project activities. Due to the linear and limited local impacts of project activities, snag levels in the project area will continue to meet the minimum thresholds for primary cavity excavators and forest plan standards for ecologically appropriate numbers.

Existing Condition and Direct/Indirect Effects: Segment 3 Timber Canyon Alternative

The following outlines the existing conditions and direct/ indirect effects for Wallowa-Whitman Management Indicator Species within the Timber Canyon Alternative. Cumulative effects are addressed within the FEIS Sec 3.3. The Timber Canyon Alternative crosses 19 miles of Forest Service administered land over two districts (La Grande and Whitman) and three subwatersheds (Big Creek, Eagle Creek, Ruckles Creek- Powder River 5th HUC). The analysis for old growth structure and old growth dependent species was run using a conservative approach of 500ft buffer as opposed to the 250 ft clearing that would actually be created by project activities. The transmission line has the potential to shift during construction because of micro site issues so by expanding the analysis to look at a 500ft buffer, it takes into account all habitat that could be affected. The analysis below represents the maximum potential impacts of the B2H project. The area of analysis (500ft buffer) is hereafter referred to as the Timber Canyon Alternative. Species viability was analyzed at the watershed and forest level.

Existing Condition: Timber Canyon Alternative

The Timber Canyon Alternative crosses 1,174 linear acres and approximately 19 miles of Forest Service land located within:

Township 6S, Range 42 E, Sections 18, 20, 21, 27, 26, 35, 36

Township 7S, Range 43 E, Sections 6, 8, 16, 21, 22, 27, 26, 36

Township 7S, Range 44E, Sections 31, 32

Township 8S, 44E, Sections 5, 4, 3, 10

Due to the long linear nature of the alternative, a diversity of habitat is intersected, though the majority of forested stands fall within the dry potential vegetation group. Existing disturbance levels in the area are low compared to the utility corridor, with no major highways, railways or powerlines existing in the area.

I. Rocky Mountain Elk

Existing Condition

The Timber Canyon Alternative falls within the Catherine (ODFW) hunting unit contained within the Wallowa Zone. Elk populations within the Wallowa Zone increased in the 1970's to near the management objective and remained steady from the 1980's to the mid 1990's. After 1995, populations started to decline. Catherine Creek has increased steadily since 2002 and is currently at 129% of the management objective.

The watersheds containing the proposed action was analyzed using a habitat effectiveness model (Thomas et al. 1988) to assess the quality of elk habitat. The HEI model evaluates size and spacing of cover and forage areas, density of open roads, quantity and quality of forage available to elk and cover quality. Forage data is unavailable and is not included in the total HEI value.

Cover: Forage Ratio –The existing cover: forage ratio is 54:46. This ratio exceeds the LRMP standard of 40:60, suggesting a higher surplus of cover. However stand data was collected in the early 80's and the ratio may misrepresent the analysis area based on changed conditions due to natural disturbances over time.

Cover Quality –The Wallowa-Whitman LRMP establishes a minimum standard for big game thermal cover (marginal and satisfactory combines). At least 30% of the forested lands should be maintained in a thermal cover condition. All Management Areas were pooled for analysis, because they have the same cover standard, thus providing for a more landscape-scale based approach. There are currently 19% of the lands are in satisfactory cover, 35% of marginal cover and 46% of forage habitat within the analysis area resulting in a cover quality value of 0.68 (Table 7).

Size and Spacing - The corresponding HEI value for size and spacing is 0.6 (Table 7) Considering an HE value of 1 is optimal, 0.6 indicates that forage to cover ratios within the analysis area is less than optimal, but acceptable. However, this variable is not meant to stand alone and therefore management decisions for providing optimum elk habitat solely based on HE size and spacing value should be used with caution.

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Open Roads – Excessive open road densities have deleterious effects on habitat effectiveness by taking land out of production (1 road mile equals 4 acres of land), reducing the effectiveness of cover and increasing disturbance to elk. The existing average open road density within the watersheds analysis area is 1.52 mi/mi^2 (Table 3). This average open road density is lower than the forest plan guideline of 2.5mi/mi^2 for MA-1. However, the road density estimate does not take into account off-road vehicle use on OHV trails, cross-country travel and on closed roads. When these variables are taken into account, road density estimates are likely to be higher. The corresponding HEI value for road densities is 0.54.

Distance band analysis- The distance band analysis found that 53% of the landscape falls within on half mile of a motor vehicle route. 13% falls within the second distance band and represents the amount of landscape where the effects of motor vehicles start to dissipate. 34% of the

landscape occurs within the third distance band and represents the amount of high to optimal quality security habitat for elk. The corresponding HEI value for the distance band analysis is 0.55.

Table 7 - Habitat-effectiveness index calculations for elk habitat within the Timber Canyon Alternative analysis area

Habitat Effectiveness Variable	Habitat Effectiveness Value (Optimal = 1.0)	Comments
HE Cover	0.68	Amount of satisfactory cover relative to marginal cover
HE Size and Spacing	0.60	Mosaic of cover and forage, 71:39
HE r value using road density	0.54	Open road density 1.79 mi/mi sq LRMP MA-1 ≤ 2.5 mi/mi sq LRMP MA-3/3A ≤ 1.5 mi/mi sq
HE r value using distance bands	0.60	Concentric bands around open roads
Total HEI using road density[1]	**0.62**	LRMP MA-1 ≥ 0.5 HEI
Total HEI using distance band analysis*	**0.65**	LRMP MA-1 ≥ 0.5 HEI
Percent of area ≥0.90 mi from open motorized route*	34%	High quality security habitat

[1]HEI calculations do not include a forage variable because current, reliable forage data are not available
*Habitat <0.90 mi from an open motorized route is considered marginal or poor

Direct/Indirect Effects- Road values were calculated using the anticipated access roads understanding that final access roads may differ slightly from original estimates. This analysis is intended to demonstrate the impacts of project activities on existing conditions. HEI values provide a watershed scale analysis of roads on the landscape and so variations in anticipated access roads at the scale of the project would not be large enough to change calculated HEI values.

Direct

Direct effects to elk from the Timber Canyon Alternative would be the disturbance associated with increased human activity. Noise, visual disturbance, and increased human traffic related to construction activities are likely to displace elk from the area in the short term.

Indirect

Cover: Forage- Project activities would occur on 1,173 acres of forested Forest Service land. 348 acres of that is currently in the stand initiation structure stage and is already in forage condition. Project activities would clear vegetation and maintain the land in a state of forage. Existing conditions show a surplus of marginal cover and while this alternative would create more forage on the landscape, the disturbance associated with powerlines would likely reduce the benefit in the short term. Cover: forage ratios would remain the same across the majority of the watersheds and the minimal increase would not affect elk distribution. The Timber Canyon Alternative does not change the cover: forage or size and spacing HEI values (Table 8)

Roads: The Timber Canyon Alternative would increase road density from 1.51 mi/mi^2 to 1.63 mi/mi^2. The amount of high quality security within the watersheds would decrease 34% to 33%. These additional roads are exclusively construction or maintenance access roads and would not be open to the public, however the ability to restrict traffic may be limited and it can be assumed that there will be an increase in disturbance outside of the times they are used for maintenance. Because of this these roads were analyzed as "open" roads and the numbers represent the highest level of disturbance that would occur. Disturbance from roads can affect elk distribution and in areas of high road densities elk exhibit higher levels of stress and increased movement rates (Wisdom 2005). Though the overall footprint of the project would be minimal in context of the watershed, the linear nature of the project increases the scale of the potential disturbance. The Timber Canyon alternative is expected to increase disturbance and effect elk distribution at the project site, but not effect distribution across the landscape. At a watershed level, the change in road density does not affect the overall habitat effectiveness value (Table 8). The Timber Canyon Alternative is consistent with LRMP standards and guidelines pertaining to elk.

Table 8 - Habitat-effectiveness index calculations for the proposed action within the Timber Canyon Alternative analysis area

Habitat Effectiveness Variable	Habitat Effectiveness Value (Optimal = 1.0)	Comments
HE Cover	0.68	Amount of satisfactory cover relative to marginal cover
HE Size and Spacing	0.60	Mosaic of cover and forage, 49:51
HE r value using road density	0.52	Open road density 1.55 mi/mi sq
HE r value using distance bands	0.59	Concentric bands around open roads
Total HEI using road density[1]	0.62	LRMP guideline $\geq$ 0.5 HEI
Total HEI using distance band analysis*	0.64	Forest guideline $\geq$ 0.5 HEI
Percent of area $\geq$0.90 mi from open motorized route*	33%	High quality security habitat

[1]HEI calculations do not include a forage variable because current, reliable forage data are not available
*Habitat <0.90 mi from an open motorized route is considered marginal or poor

II. Old Growth Structure

Existing Condition

The Timber Canyon Alternative passes through the Big Creek, Eagle Creek and Ruckles Creek-North Powder (5th HUC). The Eagle Creek watershed is within or above the historic range of variation for the two old growth structure stages- Old Forest Multi Story (OFMS) and Old Forest Single Story (OFSS). Big Creek and Ruckles Creek-North Powder watersheds are below the historic range of variation (HRV) for all Old Forest Single Stratum (OFSS) potential vegetation groups (dry, moist, cold) and below HRV for Old Forest Multi Stratum (OFMS) within the moist upland potential vegetation group. Both watersheds are within HRV for Old Forest Multi Stratum (OFMS) within the dry and cold potential vegetation groups. The analysis area contains

82 acres of OFMS and 66 acres of OFSS. Designated old growth (MA-15) occurs within the watershed, but not within the Timber Canyon Alternative.

Direct/Indirect Effects

Old growth- Project activities associated with the Timber Canyon Alternative would directly affect 148 acres of old growth habitat. The structure stage would change to stand initiation and would remain in an un-forested state for the lifetime of the power line. Project activities would not move any structure stages below HRV.

Connectivity- Connectivity is important to ensuring population persistence, species interactions and ecosystem processes. Project activities would reduce connectivity within the area by removing old growth structure that is used for foraging and movement by old growth dependent species. Though only 148 acres of old growth forest would be directly affected, reducing connectivity within a stand reduces the ecological integrity of the stand and minimizes the potential of the whole stand to function as old growth and support old growth dependent species. Additionally, the linear nature of the project increases the potential reduction of connectivity across the landscape. Taking into account the entire stands that would be intersected by the Timber Canyon Alternative, 684 acres of old growth would be impacted by project activities. Any reduction in connectivity can have negative effects on dispersal and genetic flow, especially to species with limited mobility.

III. American Marten

Existing Condition

Big Creek

The Timber Canyon Alternative passes through the center of the Big Creek Watershed (5th HUC). This watershed contains 419 acres of identified source habitat (habitat that can support a stable or increasing population of marten) out of 6,531 (6%) potential acres of marten habitat. The current watershed index is 2.60 with the historic watershed index at 0.50, indicating a high historic level of habitat quality and a current low level of habitat quality and quantity. This watershed currently provides $\geq$ 40% of the median amount of source habitat that occurred historically, and is above the threshold necessary to support marten population viability (Penninger and Keowen 2011a), however the majority of the watershed lacks the acres of cold/moist multi-story old growth needed to provide breeding habitat for marten.

Eagle Creek

The Timber Canyon Alternative runs along the southern edge of the Eagle Creek watershed (5th HUC). This watershed contains 10,367 existing acres of marten source habitat (habitat that can support a stable or increasing population of marten) out of 34,114 (30%) potential acres of marten habitat. The current watershed index is 2.19 with the historic watershed index at 2.42, indicating a high historic level of habitat quality and a current medium level of habitat quality and quantity. This watershed currently provides $\geq$ 40% of the median amount of source habitat

that occurred historically, and is above the threshold necessary to support marten population viability (Penninger and Keowen 2011a). The bulk of identified source habitat occurs in the northern part of the watershed with the southern part containing very minimal source habitat.

Ruckles Creek-Powder River

The Timber Canyon Alternative runs along the southern edge of the Eagle Creek watershed (5th HUC). This watershed contains 212 existing acres of marten source habitat (habitat that can support a stable or increasing population of marten) out of 5,185 (4%) potential acres of marten habitat. The current watershed index is 0.47 with the historic watershed index at 2.60, indicating a high historic level of habitat quality and a current medium level of habitat quality and quantity. This watershed does not currently provides $\geq$ 40% of the median amount of source habitat that occurred historically, and does not have the habitat necessary to support marten population viability (Penninger and Keowen 2011a).

Direct/Indirect Effects

The combination of warm, dry forest types and early seral stages, in the area of the Timber Canyon Alternative makes identified source habitat unlikely to be used for denning, however because of the high canopy cover the habitat could potentially be used for travel and foraging. GIS analysis identifies 22 acres of marten habitat that directly intersect the Timber Canyon Alternative and would be directly affected through habitat removal. Project activities would remove existing trees and retain the area in a non-forested state which has the potential to indirectly reduce habitat effectiveness of the entire stand (the rest of the stand outside of the area directly intersected by the Timber Canyon Alternative) due to disturbance from project activities in the short term and an increase in fragmentation, smaller patch size and reduced connectivity in the long term. When considering the remainder of the stands indirectly impacted by project activities, the Timber Canyon Alternative would directly and indirectly affect 122 acres of marten source habitat. Affected habitat does not represent large patches on the landscape but occurs across the 19 miles of Forest Service land that would be intersected by the Timber Canyon Alternative.

Viability

Taking the surrounding unsuitable habitat into context, the proposed action would have no impact on marten denning and reproduction but could represent a barrier across the watersheds for marten movement. Existing marten source habitat on the WWNF as modeled by Wales (2011) totals 129,943 acres. As a result of proposed activities under the Timber Canyon Alternative, source habitats across the forest would decline by less than 0.5%. Cluster analysis used to describe existing distribution of source habitats across the WWNF indicates that these habitats are well distributed across the forest (Penninger and Keown 2011a). Post treatment availability of source habitat would continue to exceed the threshold of 40% of the historical amount in the watersheds and will continue to contribute to habitat distribution and species viability on the WWNF. There will be no decrease in habitat quality at the scale of the WWNF.

IV. Northern Goshawk

Existing Condition

Big Creek

The Timber Canyon Alternative passes through the center of the Big Creek Watershed (5th HUC). This watershed contains 6,013 acres of identified source habitat (habitat that can support a stable or increasing population of goshawks) out of 20,371 (30%) potential acres of goshawk habitat. The current watershed index is 2.55 with the historic watershed index at 2.94, indicating a high historic level of habitat quality and a current high level of habitat quality and quantity. This watershed currently provides ≥ 40% of the median amount of source habitat that occurred historically, and is above the threshold necessary to support goshawk population viability (Penninger and Keowen 2011a). Habitat is fairly evenly distributed with the exception of the southern end.

Eagle Creek

The Timber Canyon Alternative runs along the southern edge of the Eagle Creek watershed (5th HUC). This watershed contains 27,058 existing acres of goshawk source habitat (habitat that can support a stable or increasing population of goshawk) out of 67,380 (40%) potential acres of marten habitat. The current watershed index is 2.67 with the historic watershed index at 2.94, indicating a high historic level of habitat quality and a current high level of habitat quality and quantity. This watershed currently provides ≥ 40% of the median amount of source habitat that occurred historically, and is above the threshold necessary to support goshawk population viability (Penninger and Keowen 2011a). Habitat is distributed across the watershed, with the large blocks of source habitat with high connectivity occurring in the northern part of the watershed within the Eagle Cap wilderness.

Ruckles Creek-Powder River

The Timber Canyon Alternative runs along the southern edge of the Eagle Creek watershed (5th HUC). This watershed contains 6,253 existing acres of goshawk source habitat (habitat that can support a stable or increasing population of goshawk) out of 20,049 (31%) potential acres of marten habitat. The current watershed index is 2.55 with the historic watershed index at 2.94, indicating a high historic level of habitat quality and a current medium level of habitat quality and quantity. This watershed currently provides ≥ 40% of the median amount of source habitat that occurred historically, and has the habitat necessary to support goshawk population viability (Penninger and Keowen 2011a). Habitat is distributed along the eastern part of the watershed.

Direct/Indirect Effects

The Timber Canyon Alternative would directly impact 86 acres of goshawk source habitat. Affected acres would be cleared of vegetation and maintained in a non-forested condition. They would no longer serve as source habitat and disturbance from access roads could preclude goshawks from nesting in the near vicinity. Project activities would remove existing trees and

retain the area in a non-forested state which has the potential to indirectly reduce habitat effectiveness of the entire stand (the rest of the stand outside of the area directly intersected by the Timber Canyon Alternative) due to disturbance from project activities in the short term and an increase in fragmentation, smaller patch size and reduced connectivity in the long term. When considering the remainder of the stands directly impacted by project activities, the Timber Canyon Alternative could directly and indirectly affect 372 acres of goshawk source habitat. Affected habitat does not represent large patches on the landscape but occurs across the 19 miles of Forest Service land that would be intersected by the Timber Canyon Alternative. This reduces the impact the alternative would have on core nesting habitat however, increases the potential impact the alternative would have on connectivity and dispersal within the watersheds.

No active or historical (nests found within the past 5 years) are known in the area, however surveys conducted from the early 1990's to the early 2000's found nests within the vicinity of the alternative. Goshawk surveys will be conducted before project activities occur. Any active nests during the time of construction will be protected with timing restrictions. However, the 30 acre no treatment buffer required by Eastside Screens would not be maintained. After birds have fledged, habitat would be removed for transmission line activities.

Viability

Existing goshawk source habitat on the WWNF, as modeled by Wales (2011), totals 440,696 acres. As a result of projected habitat reduction by the Timber Canyon Alternative, source habitats at the Forest-level would decline by less than 0.5%. Cluster analysis used to describe existing distribution of source habitats across the WWNF indicates that these habitats are well distributed across the Forest (Penninger and Keown 2011).

Because this project impacts less than 0.5% of source habitat across the Forest, the overall direct and indirect effects will result in minimal effect to goshawk habitat and the loss of habitat would be insignificant at the scale of the WWNF. Post-treatment availability of source habitats would continue to exceed the threshold of 40% of the historical amount within the watersheds, thereby continuing to contribute to habitat distribution and species viability on the WWNF.

V. Pileated Woodpecker

Existing Condition

Big Creek

The Timber Canyon Alternative passes through the center of the Big Creek Watershed (5^{th} HUC). This watershed contains 1,959 acres of identified source habitat (habitat that can support a stable or increasing population of pileated woodpeckers) out of 17,308 (11%) potential acres of pileated habitat. The current watershed index is 1.81 with the historic watershed index at 2.63, indicating a high historic level of habitat quality and a current medium level of habitat quality and quantity. This watershed does not currently provides $\geq$ 40% of the median amount of source habitat that occurred historically, and does not have the habitat necessary to support pileated woodpecker population viability (Penninger and Keowen 2011a).

Eagle Creek

The Timber Canyon Alternative runs along the southern edge of the Eagle Creek watershed (5th HUC). This watershed contains 58,064 existing acres of goshawk source habitat (habitat that can support a stable or increasing population of pileated woodpecker) out of 18,569 (32%) potential acres of marten habitat. The current watershed index is 2.63 with the historic watershed index at 2.27, indicating a high historic level of habitat quality and a current high level of habitat quality and quantity. This watershed currently provides ≥ 40% of the median amount of source habitat that occurred historically, and is above the threshold necessary to support pileated woodpecker population viability (Penninger and Keowen 2011a). The bulk of identified source habitat occurs in the northern part of the watershed within the wilderness, with the southern part containing very minimal source habitat.

Ruckles Creek-Powder River

The Timber Canyon Alternative runs along the southern edge of the Eagle Creek watershed (5th HUC). This watershed contains 925 existing acres of pileated woodpecker source habitat (habitat that can support a stable or increasing population of pileated woodpeckers) out of 15,046 (6%) potential acres of marten habitat. The current watershed index is 0.57 with the historic watershed index at 2.63, indicating a high historic level of habitat quality and a current low level of habitat quality and quantity. This watershed does not currently provides ≥ 40% of the median amount of source habitat that occurred historically, and does not have the habitat necessary to support pileated population viability (Penninger and Keowen 2011a).

Direct/Indirect Effects

The Timber Canyon Alternative would impact 63 acres of pileated source habitat. Project activities would remove trees from the landscape and maintain it in a non-forested condition. Any existing snags would be removed, and this area would not contribute to future snags. Lack of canopy cover and lack of snags would preclude this area from becoming pileated woodpecker habitat. Project activities have the potential to indirectly reduce habitat effectiveness of the entire stand (the rest of the stand outside of the area directly intersected by the Timber Canyon Alternative) due to disturbance from project activities in the short term and an increase in fragmentation, smaller patch size and reduced connectivity in the long term. When considering the remainder of the stands directly impacted by project activities, the Timber Canyon Alternative could directly and indirectly affect 281 acres of pileated source habitat.

Viability

Two watersheds do not provide enough source habitat to support a population of pileated woodpecker. The Eagle Creek watershed provides sufficient habitat. However the bulk of identified source habitat occurs in the northern part of the watershed within the wilderness, with the southern part, where the alternative would occur, containing very minimal source habitat. Taking the surrounding unsuitable habitat into context, the proposed action would have no impact on pileated reproduction but could represent a barrier for pileated movement.

Existing pileated woodpecker source habitat on the WWNF as modeled by Wales (2011) totals 129,943. As a result of the Timber Canyon Alternative no pileated source habitat across the forest would be impacted in the medium term (30-50 years). Cluster analysis is used to describe existing distribution of source habitats across the WWNF and indicate that these habitats are well distributed across the Forest (Penninger and Keown 2011c). Because this project doesn't affect suitable habitat across the Forest, the overall direct and indirect effects will result in a small negative effect to pileated woodpecker habitat. The loss of habitat will be insignificant at the scale of the WWNF. Post-treatment availability of source habitats would continue to exceed the threshold of 40% of the historical amount in the watersheds thereby continuing to contribute to habitat distribution and species viability on the WWNF.

VI. Primary Cavity Excavators

Existing Condition

Existing conditions for snag and log habitat are based on analysis done for the Bald Angel Vegetation Management Project (2005) which covers the same watersheds as the Timber Canyon Alternative. A large fire occurred in the Eagel Creek watershed during the sumer of 2015 and increased snag numbers in the northern part of the watershed. No other large fire, insect or disease events have happened within the watersheds that would have dramatically changed snag and log conditions in the past 10 years. Within these watersheds, based on field reconnaissance (summer/fall 2005 snag levels averaged 3 snags/acre in the drier stand type and 4 snags/acre in the moister stand type.

Down wood in all size classes (0 - 0.25 in, 0.25 - 1 in, and > 3 in) is common throughout the watersheds, with the total volume of down wood exceeds LRMP standards. Within the watersheds the cold upland forest types contain (< 30 tons/acre fuel loads), the dry upland forest types contain (< 20 tons/acre fuel loads), and the moist upland forest types contain (>30 tons/acre fuel loads).

The habitat categories from DecAID that most closely reflect conditions in the Timber Canyon Alternative area are the "Small/medium tree" structural conditions within the "Eastside Mixed Conifer Forests, East Cascades/Blue Mountains" and "Small/medium tree" structural conditions in "Ponderosa Pine/Douglas-fir Forest" wildlife habitat descriptions. DecAID synthesized data for wildlife use of snag densities, by a representative sample of PCEs possibly found within the analysis area, are given below (Table 9). Effects are discussed in terms of snag densities with and without the proposed treatments, and how those densities relate to tolerance levels for wildlife species that utilize snags. The information is presented at three statistical tolerance levels which may be interpreted as three levels of "assurance": low (30% TL), moderate (50% TL) and high (80% TL). Each tolerance level is the amount of assurance a land manager would have that they are meeting the habitat needs of the specific species (e.g., 0.3 snags per acre <10 inches dbh would provide a 30% assurance of meeting habitat needs for white headed woodpeckers).

Table 9 - DecAID synthesized data for wildlife use of snag densities for ponderosa pine/Douglas-fir habitat type and small/medium trees and larger trees structural condition classes (PPDF_S/L)

	Snags > 10 in dbh			Snags > 20 in dbh		
	30% TL[1]	50% TL	80% TL	30% TL	50% TL	80% TL
Species	Snag density (#/acre)	Snag density (#/acre)	Snag density (#/acre)	Snag density (#/acre)	Snag density (#/acre)	Snag density (#/acre)
White-headed woodpecker	0.3	1.7	3.7	0.5	1.8	3.8
Pygmy nuthatch	1.1	5.6	12.1	0.0	1.6	4.0
Black-backed woodpecker	2.5	13.6	29.2	0.0	1.4	5.7
Williamson's sapsucker	14.0	28.4	49.7	3.3	8.6	16.6
Pileated woodpecker	14.9	30.1	49.3	3.5	7.8	18.4

[1]TL = Tolerance level.

Existing snag densities (< 20in dbh, Table 7) were compared to wildlife tolerance levels (Table 6). For white-headed woodpeckers, snag density estimates are between the 50% and 80% TL for snags >10 in dbh and snags > 20 in dbh in dry and upland forest and at 80% TL for all snags >10 dbh in the cold upland forest. For pygmy nuthatches, snag densities are between the 30% and 50% TL for snags >10 in dbh and snags > 20 in dbh in all in dry and upland forest and at 80% TL for snags >10 dbh in the cold upland forest. For black-backed woodpeckers, snag densities are below 30% and 50% TLs for snags >10 in dbh and between 30%-50% TLs for snags > 20 in dbh in dry and upland forest and at 30% TL for snags >10 dbh in the cold upland forest. For Williamson's sapsucker and the pileated woodpecker, snag densities are well below the 30% TL for snags >10 in dbh and around 30% TL for snags > 20 in dbh for all potential vegetation groups. The studies used in DecAID to derive this data are largely from NE Oregon and are applicable to the project area. At the existing snag densities and sizes, Williamson's sapsuckers and pileated woodpeckers will not use the majority of the project area for nesting, roosting, or foraging. These birds need areas with snag densities much higher than those in the project area. Historically, white-headed woodpeckers probably used most of the lower elevation areas within the analysis area. Source habitats for low-elevation old-forest species have declined more than any other habitat type from historical to current conditions and populations of white-headed woodpeckers have declined strongly along with this loss of habitat (Wisdom et al. 2000). Retention of downed logs is based on Amendment #2. DecAID provides estimates of percent cover of downed wood. The existing down wood data is in tons per acre. A direct conversion to percent cover tolerance levels is not possible without the length of the logs and diameter, and this data is not available. However, estimates of post project down wood exceed LRMP standards.

Direct/Indirect Effects

The Timber Canyon Alternative would directly impact 1,174 acres of forested habitat. Project activities would remove trees from the landscape and maintain it in a non-forested condition. Any existing snags would be removed, and this area would not contribute to future snags. Project activities will also add access roads to the landscape, which can lead to an increase is snag loss due to firewood cutting though the effects are difficult to quantify. Access roads are intended to be closed to the public, however enforcement is difficult and some degree of public use can be expected.

Project activities would permanently remove any existing snags as well as the possibility of future snag recruitment. However, taking into consideration the size of the project, watershed conditions will not change. Snag levels in the project area will still meet the minimum thresholds for primary cavity excavators and still meet forest plan standards for ecologically appropriate numbers.

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APPENDIX F2
U.S. FOREST SERVICE AQUATIC MANAGEMENT INDICATOR SPECIES ANALYSIS

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U.S. Forest Service Aquatic Management Indicator Species Analysis

U. S. Forest Service (USFS) regulations require site-specific analysis of the effects of actions on species identified as Management Indicator Species in the Wallowa-Whitman Forest Land and Resource Management Plans (USFS 1990) as amended. This analysis was conducted for the Boardman to Hemingway Transmission Line Project and meets USFS regulations, policies and objectives for MIS management.

The Wallowa-Whitman National Forest Land and Resource Management Plan (USFS 1990) identifies two MIS fish species as the redband /rainbow trout and steelhead. These species were selected as they were considered to be good indicators of the maintenance and quality of instream habitats. These habitats were identified as high quality water and fishery habitat.

The NFMA regulations require that "fish and wildlife habitat be managed to maintain viable populations of existing …species in the planning area." To ensure that these viable populations are maintained, the Pacific Northwest Region of the Forest Service has identified management requirements for a number species within the region. These MIS are emphasized either because of their status under ESA or because their populations can be used as an indicator of the health of a specific type of habitat (USFS 1990).

Riparian ecosystems occur at the margins of standing and flowing water, including intermittent stream channels, ephemeral ponds, and wetlands. The aquatic MIS were selected to indicate healthy stream and riparian ecosystems across the landscape. Attributes of a healthy aquatic ecosystem includes: cold and clean water; clean channel substrates; stable streambanks; healthy streamside vegetation; complex channel habitat created by large wood, cobbles, boulders, streamside vegetation, and undercut banks; deep pools; and waterways free of barriers. Healthy riparian areas maintain adequate temperature regulation, nutrient cycles, natural erosion rates, and provide for instream wood recruitment.

1.0 Segments 1 and 2- All Alternative Routes

1.1 Existing Conditions

All B2H Project alternative routes cross Forest Service land in Segment 1 and Segment 2 in the Pelican Creek subwatershed. In Segment 1, alternative routes include the Applicant's Proposed Action Alternative (including Variations S1-B1 and S1-B2), the East of Bombing Range Road Alternative, the Applicant's Proposed Action – Southern Route Alternative, the West of Bombing Range Road – Southern Route Alternative, the Longhorn Alternative, the Interstate 84 Alternative, and the Interstate 84 – Southern Route Alternative. In Segment 2, alternative routes include the Applicant's Proposed Action Alternative (including Variations S2-A1 and S2-A2), the Glass Hill Alternative, and the Mill Creek Alternative.

The analysis area for USFS MIS for steelhead and redband trout/ rainbow trout MIS habitat for Segments 1 and 2 is the Pelican Creek subwatershed. The fish bearing streams in this subwatershed are Dry Creek, California Gulch and Pelican Creek (and two tributaries to Pelican Creek). Habitat for steelhead and redband trout/ rainbow trout that exists within or adjacent to the proposed route, was considered in this analysis. Table 1 below shows the MIS fish species on the Wallowa-Whitman National Forest, the habitat associated with these species, and presence in the analysis area for Segments 1 and 2. Table 2 shows the distribution of MIS habitat in the Pelican Creek subwatershed in relation to the Wallowa-Whitman National Forest. Methods used to document and calculate fish distribution in the project area include StreamNet database that maintains data from projects that monitor fish populations and aquatic habitat throughout the Columbia Basin.

Table 1. MIS and habitat description for Segments 1 and 2			
MIS	**Habitat Description**	**Habitat Present in Analysis Area**	**Species Present in Analysis Area**
Rainbow Trout/ Redband Trout	Water quality/ Fish Habitat	Yes	Yes
Steelhead		Yes	Yes

The amount of occupied MIS habitat on the Wallowa Whitman National Forest ranges from about 990 miles to over 1,310 miles, depending on the species (See Table 2). Based on GIS analysis there are approximately 16.4 miles of MIS habitat on National Forest land in the analysis area (Pelican Creek subwatershed). In general, redband trout/rainbow trout and steelhead have similar stream and riparian ecosystem requirements. However, there are some differences in habitat utilized by steelhead and redband trout/rainbow trout at various life stages across the forest. Because the habitat requirements for each species are generally similar and often overlap, they were collectively chosen to represent healthy stream and riparian ecosystems on the Wallowa-Whitman National Forest. Based on GIS analysis, the amount of MIS habitat in the analysis area (16.4 miles for steelhead and redband trout) represents a fraction of the overall miles of habitat for the entire forest. There is no MIS habitat on National Forest land in the analysis area crossed by the B2H Project alternative routes or variations.

Table 2. MIS distribution in the analysis area in relation to the Wallowa-Whitman National Forest			
MIS	**Forest Distribution (mi)[1]**	**MIS in Analysis Area (mi)**	**Proportion of MIS habitat in Project Area out of total on Forest**
Rainbow Trout/ Redband Trout	1,310	16.4	1%
Steelhead	990	16.4	2%

[1]Miles calculated for the Wallowa-Whitman National Forest.

Table 3 shows the results of fish habitat surveys for streams that have had habitat surveys completed within the analysis area. This information was obtained from the Region 6 (R6) stream survey database and surveys are on file at the La Grande Ranger District. Surveys within the analysis area were completed in 1993. Survey information was collected utilizing the Hankin and Reeves methodology as modified by the Pacific Northwest R6 Regional Office. Surveys from the early 1990s may not represent current habitat conditions within streams, but does provide information on the general character of streams. The number of pieces of large wood has likely increased due to large wood recruitment since the early 1990s potentially leading to an increase in the number of pools per mile. The width to depth ratio is probably similar to those found in the early 1990s.

Table 3. Results of instream habitat surveys for streams with MIS habitat within the Project Area						
Stream/Year Surveyed	**Survey Length (miles)**	**Pools (#/mile)**	**Wetted Width (ft)**	**Stable Banks (%)**	**W/D Ratio**	**LWD (pcs/mi)**
California Gulch/1993	3.7	46	7.2	ND	11.2	133
Dry Creek/1993	1.8	27	9.3	ND	11.0	19
Pelican Creek/2010	6.1	49	9.9	93	18.4	12
Rugg Springs Tributary/ 1993	2.5	25	3.4	ND	6.6	23

ND=No Data

Pelican Creek Subwatershed-Interpretation of Habitat Data

California Gulch (Table 4) **–** Habitat conditions in California Gulch are mostly good with a few habitat features rated as poor to fair. There are higher than desirable road densities in the subwatershed, low number of full channel spanning pools, and slightly high width to depth ratio in regard to the PACFISH Riparian Management Objectives (RMO) of < 10. However, the width to depth ratio is within the range of width to depth ratios described for Rosgen (1996) stream types**.** California Gulch alternates between a Rosgen B3 and B4 stream type. The Rosgen width to depth ratios ranges from 11.7 to 38.0 for B3 stream types and ranges from 10.7 to 36.7 for B4 stream types. There is a high amount of instream large woody material, there is a high percentage

of stable streambanks, and there are presently no fish barriers in California Gulch. Outside of the habitat survey area there is additional loss of riparian zone vegetation due to right of way clearing for the BPA transmission line corridor.

Table 4. MIS habitat summary for California Gulch		
Habitat Element	**Value**	**Rating**
Road Density (open and closed)	3.8 mi/mi^2 (subwatershed)	Not Properly Functioning
Stream Temperature	<64.4^{0}F (RMO value)	Functioning At Risk
Streambank Stability	>90% (RMO value)	Properly Functioning
Pool Frequency/Quality	96 pools/mi (RMO value)	Not Properly Functioning
Large Wood	>20 pcs/mi (RMO value)	Properly Functioning
Riparian Zone Vegetation	Minimal loss due to a road crossing	Properly Functioning*
Fish Barrier	None	Properly Functioning

Dry Creek (Table 5) **-** Habitat conditions in Dry Creek are mostly fair. There are higher than desirable road densities in the subwatershed, low number of full channel spanning pools, and slightly high width to depth ratio in regard to the PACFISH RMO of < 10. The Rosgen stream type for Dry Creek alternates between a C3 and B3. The width to depth for Rosgen C3 stream type ranges from 10.3 to 90, and the width to depth ratio for Rosgen B3 stream type ranges from 11.7 to 38.0. Impacts to habitat include an interstate, a railroad, a state highway, and utility corridor. One culvert under Interstate I-84 is a partial barrier to the upstream passage of salmonids. This culvert is within the Oregon Department of Transportation right of way. The railroad constricts the stream in areas and reduces the amount of riparian vegetation and streamside conifers. Dry Creek, as the name implies, becomes dry after spring runoff except for a few isolated pools and areas of puddled flow (Photos 4, 5).

Table 5. MIS habitat summary for Dry Creek		
Habitat Element	**Value**	**Rating**
Road Density (open and closed)	3.8 mi/mi^2 (subwatershed)	Not Properly Functioning
Stream Temperature	<64.4^{0}F (RMO value)	Functioning At Risk
Streambank Stability	>90% (RMO value)	Properly Functioning
Pool Frequency/Quality	96 pools/mi (RMO value)	Functioning At Risk
Large Wood	>20 pcs/mi (RMO value)	Functioning At Risk
Riparian Zone Vegetation	Areas highly impacted by railroad	Functioning At Risk
Fish Barrier	One culvert	Functioning At Risk

Pelican Creek (Table 6) **-** Habitat conditions in Pelican Creek are rated as fair. There are higher than desirable road densities in the subwatershed, lower than desirable number of full channel spanning pools, and lower than desirable amount of large wood. Streambank stability is good with 93% stable streambanks. Riparian zone vegetation is in relatively good condition except for where the 3104 road crosses. An undersized culvert has damaged streambanks and riparian vegetation downstream of the crossing. This culvert is also a partial barrier to the upstream migration of salmonids. The width to depth ratio of 18.4 exceeds the PACFISH RMO of <10, but is within the expected range of width to depth ratios for Rosgen B3 stream types of 11.7 to 38.0. Pelican Creek becomes dry after spring runoff except for isolated pools and areas of intermittent flow that support juvenile steelhead and resident redband trout.

Table 6. MIS habitat summary for Pelican Creek		
Habitat Element	**Value**	**Rating**
Road Density (open and closed)	3.8 mi/mi^2 (subwatershed)	Not Properly Functioning
Stream Temperature	<64.4^{0}F (RMO value)	Functioning At Risk
Streambank Stability	>90% (RMO value)	Properly Functioning
Pool Frequency/Quality	96 pools/mi (RMO value)	Not Properly Functioning
Large Wood	>20 pcs/mi (RMO value)	Properly Functioning

Table 6. MIS habitat summary for Pelican Creek		
Habitat Element	**Value**	**Rating**
Riparian Zone Vegetation	Minimal loss due to roads	Properly Functioning
Fish Barrier	One culvert	Functioning At Risk

Rugg Spring Tributary (Table 7) **-** Habitat conditions in Rugg Springs Tributary are rated as fair. There are higher than desirable road densities in the subwatershed, and lower than desirable number of full channel spanning pools. There is a culvert under the railroad that is a partial barrier to the upstream migration of salmonids. The fishbearing portion of the stream is in a steep canyon with no road access. The stream has a desirable number of pieces of large wood and narrow width to depth ratio of <10. Rugg Springs Tributary becomes mostly dry after spring runoff except for isolated pools maintained by subsurface flow and areas of intermittent stream flow that supports juvenile steelhead and resident trout.

Table 7. MIS habitat summary for Rugg Springs Tributary		
Habitat Element	**Value**	**Rating**
Road Density (open and closed)	3.8 mi/mi^2 (subwatershed)	Not Properly Functioning
Stream Temperature	<64.4^{0}F (RMO value)	Functioning At Risk
Streambank Stability	>90% (RMO value)	Properly Functioning
Pool Frequency/Quality	96 pools/mi (RMO value)	Not Properly Functioning
Large Wood	>20 pcs/mi (RMO value)	Properly Functioning
Riparian Zone Vegetation	Good condition due to no road access.	Properly Functioning
Fish Barrier	One culvert under railroad	Functioning At Risk

3104 Tributary (Table 8) **-** Habitat conditions in the 3104 Tributary are fair with a few habitat features rated as poor. No stream habitat surveys have been conducted on the stream. Habitat conditions are based on observations made by fish and watershed personnel during field reconnaissance. There are higher than desirable road densities in the subwatershed, lower than desirable number of full channel spanning pools, and lower than desirable amount of large wood. There are no fish barriers.

Table 8. MIS habitat summary for 3104 Tributary		
Habitat Element	**Value**	**Rating**
Road Density (open and closed)	3.8 mi/mi^2 (subwatershed)	Not Properly Functioning
Stream Temperature	<64.4 ^{o}F (RMO value)	Functioning At Risk
Streambank Stability	>90% (RMO value)	Properly Functioning
Pool Frequency/Quality	96 pools/mi	Not Properly Functioning
Large Wood	>20 pcs/mi	Properly Functioning
Riparian Zone Vegetation	Loss due to roads and past harvest.	Functioning At Risk
Fish Barrier	None	Properly Functioning

All Alternative Routes

All B2H Project alternative routes cross Forest Service land in Segment 1 and Segment 2, including Variations S1-B1, S1-B2, S2-A1, and S2-A2, in the Pelican Creek subwatershed. Variation S2-A2 would co-locate with the existing Bonneville Power Administration transmission line. The alternative routes and variations would not enter Riparian Habitat Conservation Areas.

No B2H Project alternative routes or variations cross or are adjacent to MIS habitat on Wallowa-Whitman National Forest land, however, the alternative routes and variations cross Dry Creek on Blue Mountain Forest State Scenic Corridor (State of Oregon land) approximately .25 miles upstream of the Forest Service land boundary along Link 1-77. Dry Creek is spawning and rearing habitat for ESA listed Snake River Basin Summer Steelhead and also has redband/rainbow trout (StreamNet 2016). Blue Mountain Forest State Scenic Corridor land is adjacent to Dry Creek for approximately 2 river miles; upstream and downstream of this land parcel Forest Service land is adjacent to Dry Creek for approximately 5.8 miles (StreamNet 2016). There is no habitat

for steelhead and rainbow/redband trout in the analysis area immediately on National Forest for the alternative routes and variations in Segments 1 or 2, however there is species presence and habitat in the Pelican Creek subwatershed in areas bordering National Forest land. Table 1 describes the MIS, the habitat they represent, and whether they are present on National Forest land in the analysis area.

Variation S1-B2 of the Proposed Action Alternative

Variation S1-B2 of the Proposed Action Alternative would co-locate with the existing BPA 230 kV transmission line and would cross two riparian areas including California Gulch twice and Dry Creek once on Wallowa-Whitman National Forest. The current BPA transmission line right of way on National Forest crosses at these locations and is adjacent to California Gulch and within the riparian habitat conservation area for an unknown distance (less than 1 mile). All riparian vegetation is cleared along California Gulch at the BPA right of way (Photo 1, 2 and 3). California Gulch and Dry Creek are fishbearing streams with both MIS species and spawning and rearing habitat for ESA listed Snake River Basin Summer Steelhead (StreamNet 2016).

Photo 1. California Gulch BPA 230 kV transmission line and riparian clearing

Photo 2. California Gulch BPA transmission line and riparian clearing

Photo 3. California Gulch BPA 230 kV transmission line and riparian clearing

Approximately 0.75 miles downstream of the location that the existing BPA transmission line crosses Dry Creek there is a partial barrier to steelhead. During periods of low flow a barrier exists to migrating adult steelhead due to a location in the creek where railroad fill has pinched the creek and fill has sloughed off into the creek. The material is artificially large for the creek and low flows go subsurface. When the railroad was built the channel was filled in and Dry Creek was rerouted so that the left bank is pushed up against a bluff and the right bank is railroad fill (Photos 4 and 5). This constriction in the channel at this location caused the channel upstream to aggrade, fill in with sediment, and convert to meadow habitat.

Photo 4. Dry Creek fill in channel, flow dependent barrier for steelhead

Photo 5. Dry Creek railroad fill in channel, flow dependent barrier for steelhead

1.2 Effects Analysis

All Alternative Routes

Potential effects to MIS fish species from the B2H Project alternative routes include construction and location of the crossing at Dry Creek on state land. Depending on the location, construction methods, extent of vegetation clearing and number and location of access roads constructed or utilized near Dry Creek, there is potential for short and long term effects to MIS species and habitat in Dry Creek. Removal of riparian vegetation adjacent to Dry Creek at the crossing could remove vegetation that shades the stream and could impact stream temperature by increasing the amount of direct solar radiation. Loss of streamside vegetation could also remove cover used by fish as refuge during periods of low flow and to avoid predation. In addition there are higher than desirable road densities in the Pelican Creek subwatershed and constructing any additional roads in the subwatershed for construction or maintenance access in the proposed action could impact habitat connectivity, increase erosion and sediment into waterways and effect hydrologic connectivity, which could impact MIS and MIS habitat. Potential effects would be mitigated by implementation of Design Feature 15 Reduce Impacts on Riparian Areas, Design Feature 16 Span Riparian Communities/Water Courses, and Design Feature 20 Reduce Potential for Aquatic Invasive Species (refer to Table 2-7 in Chapter 2).

Variation S1-B2 of the Proposed Action Alternative

In addition to the effects discussed above, Variation S1-B2 of the Proposed Action Alternative would include an increased area of clearing of riparian vegetation where the existing BPA line crosses Dry Creek and California Gulch and where the existing line parallels California Gulch. Increased riparian vegetation removal could

remove vegetation that shades the stream and could impact stream temperature by increasing the amount of direct solar radiation. Loss of streamside vegetation could also remove cover used by fish as refuge during periods of low flow and warm water temperature and to avoid predation. In addition there are higher than desirable road densities in the Pelican Creek subwatershed and adding any additional roads in the subwatershed for construction or access for Variation S1-B2 of the Proposed Action Alternative could impact habitat connectivity, increase erosion and sediment into waterways and effect hydrologic connectivity, which could impact MIS and MIS habitat.

2.0 Segment 3- Timber Canyon Alternative

2.1 Existing Conditions

The only B2H Project alternative route that crosses Forest Service land in Segment 3 is the Timber Canyon Alternative. The Timber Canyon Alternative traverses the Lower Big Creek, Upper Big Creek subwatershed, Middle Big Creek Subwatershed and Goose Creek subwatershed on Forest Service land.

The analysis area for Forest Service MIS for the Timber Canyon Alternative is redband trout/ rainbow trout MIS habitat is Forest Service acres of Middle Big Creek subwatershed, Upper Big Creek subwatershed and Goose Creek subwatershed. The fish bearing streams in these three subwatersheds are Big Creek and Goose Creek. Habitat for redband trout/ rainbow trout, an MIS species that exists within or adjacent to the Timber Canyon Alternative, is included in the analysis area. Table 9 below shows the MIS fish species on the Wallowa Whitman National Forest, the habitat associated with these species, and whether they are present in the project analysis area.

Table 9. MIS and habitat description for the Timber Canyon Alternative

MIS	Habitat Description	Habitat Present in Analysis Area	Species Present in Analysis Area
Redband Trout /Rainbow Trout	Water quality/ Fish Habitat	Yes	Yes
Steelhead		No	No

In general, redband trout/rainbow trout and steelhead have similar stream and riparian ecosystem requirements. However, there are some differences in habitat utilized by steelhead and redband trout/rainbow trout at various life stages across the forest. Because the habitat requirements for each species are generally similar and often overlap, they were collectively chosen to represent healthy stream and riparian ecosystems on the Wallowa-Whitman National Forest.

Methods used to document fish distribution include field presence/absence surveys and aquatic inventory surveys compiled over time and often related to land management activities in a specific location. The origin of this data has come from several sources including Forest Service watershed baseline updates, and Forest Service Level II stream survey reports on fish-bearing streams using the Hankin and Reeves stream survey method (USFS 2014). Wallowa Whitman National Forest Geographic Information System data (GIS) catalogues miles of MIS distribution by fish species. Only presence/absence surveys have been completed for redband trout/rainbow trout in the project area and have been updated in the Region 6 Fish Distribution Database (USFS 2015).

Redband/Rainbow Trout

Redband trout/rainbow trout habitat requirements are similar to that of juvenile steelhead. Redband trout/rainbow trout are sensitive to changes in water quality and habitat. Adult redband/rainbow trout are generally associated with pool habitat, although other life stages require a wide array of habitats for rearing, hiding, feeding and resting. Pool habitat is important refugia during low water periods. An increase in sediment

in the stream channel lowers spawning success and reduces the quality and quantity of pool habitat. Other important habitat features include healthy riparian vegetation, undercut banks and large wood debris. The Wallowa-Whitman National Forest is utilizing this fish/habitat relationship to provide the basis for assessment of redband/rainbow trout populations for the purposes of MIS assessment.

Only presence/absence surveys have been completed for resident salmonid species (redband/rainbow trout) in the analysis area. These surveys were part of the Level II fish habitat surveys that were completed in Big Creek in 2006 and Goose Creek in 2009. In the absence of redband/rainbow trout population trend data, the Wallowa-Whitman National Forest has measured key habitat variables, and then assessed changes expected to occur as a result of project activities. This MIS analysis assumes that activities that maintain and improve aquatic/riparian habitat will provide for resident fish population viability on Wallowa-Whitman National Forest lands.

Habitat Condition

The Wallowa-Whitman National Forest has completed Forest Service Region 6 Stream Surveys for fish-bearing streams in the analysis area. The Forest Service surveyed Big Creek in 1991, 1996 and 2006 and Goose Creek in 2009. The stream survey protocol (based on the Hankin and Reeves survey methodology) for Level II fish habitat survey includes collection of field data for stream channels, riparian vegetation, and fish species composition and distribution (USFS 2014). Measured habitat data is summarized in Table 10 and stream habitat metrics for Big Creek and Goose Creek compared to PACFISH/INFISH Biological Opinion Riparian Management Objectives (RMO) is summarized in Table 11.

Table 10. Habitat summary data for fishbearing streams for the Timber Canyon Alternative

Stream Name	Wetted Width	Pools/Mile[1]	Pieces LWD/Mile	W/D Ratio	% Stable Banks
Big Creek (2006)	11.3	17	8	21.8	99.7*
Goose Creek (2009)	18.5	27	19	16.0	92.8*
RMO	ND	56	>20	<10	>90

ND=No Data
[1]RMO based on stream width. Wetted widths 10-20 feet = 56 pools/mile.
*Habitat element is meeting INFISH RMOs Miles calculated for the Wallowa-Whitman National Forest.

Lower Big Creek Subwatershed

There are no fishbearing streams on the National Forest portion of the subwatershed. Approximately 9.6% of the subwatershed area is National Forest.

Middle Big Creek Subwatershed

The Middle Big Creek subwatershed is 13,791 acres, 9,037 of these acres are on Forest Service land. Middle Big Creek subwatershed has 4.7 miles of verified redband/rainbow trout habitat; 3.6 miles are on Forest Service land.

Big Creek (Table 11) - Habitat conditions in Big Creek in the Middle Big Creek subwatershed are fair. There are higher than desirable road densities in the subwatershed, low number of full channel spanning pools, lower than desirable number of pieces of large wood, and high width to depth ratio in regard to the PACFISH RMO of < 10. However, the width to depth ratio is within the range of width to depth ratios described for Rosgen (1996) stream types. Big Creek is a Rosgen B3 stream type. The Rosgen width to depth ratio for a Rosgen B3 stream type ranges from 11.7 to 38.0 and averages 18.8. There is a high percentage of stable streambanks, and there are presently no fish barriers in the subwatershed.

Table 11. MIS habitat summary for Big Creek in Middle Big Creek subwatershed		
Habitat Element	**Value**	**Rating**
Road Density (open and closed)	5.9 (Middle Big Creek subwatershed)	Not Properly Functioning
Stream Temperature	<64.4^{0}F (RMO value)	Functioning At Risk
Streambank Stability	>90% (RMO value)	Properly Functioning
Pool Frequency/Quality	56 pools/mi (RMO value)	Not Properly Functioning
Large Wood	>20 pcs/mi (RMO value)	Not Properly Functioning
Riparian Zone Vegetation	Loss due to draw bottom road	Functioning At Risk
Fish Barrier	None	Properly Functioning

Upper Big Creek Subwatershed

The Upper Big Creek subwatershed is 10,385 acres. The entire subwatershed in on Forest Service land. There are 19.2 miles verified of redband/ rainbow trout habitat in the Upper Big Creek subwatershed.

Big Creek (Table 12) **–** Habitat conditions in Big Creek in the Upper Big Creek subwatershed are also fair. There are higher than desirable road densities in the subwatershed, low number of full channel spanning pools, lower than desirable number of pieces of large wood, and high width to depth ratio in regard to the PACFISH RMO of < 10. However, the width to depth ratio is within the range of width to depth ratios described for Rosgen (1996) stream types. Big Creek is a Rosgen B3 stream type. The Rosgen width to depth ratio for a Rosgen B3 stream type ranges from 11.7 to 38.0 and averages 18.8.There is a high percentage of stable streambanks. There is one fish barrier, a culvert in the headwaters near the end of fish distribution.

Table 12. MIS habitat summary for Big Creek in Upper Big Creek subwatershed		
Habitat Element	**Value**	**Rating**
Road Density (open and closed)	6.3 mi/mi^2 (Upper Big Creek subwatershed)	Not Properly Functioning
Stream Temperature	<64.4^{0}F (RMO value)	Functioning At Risk
Streambank Stability	>90% (RMO value)	Properly Functioning
Pool Frequency/Quality	56 pools/mi (RMO value)	Not Properly Functioning
Large Wood	>20 pcs/mi (RMO value)	Not Properly Functioning
Riparian Zone Vegetation	Loss due to draw bottom road.	Functioning At Risk
Fish Barrier	Culvert near headwaters	Functioning At Risk

Goose Creek Subwatershed

The Goose Creek subwatershed is 30,393 acres, 17,681 acres are on Forest Service land. There are a total of 18.98 miles of verified redband/ rainbow trout habitat in the Goose Creek subwatershed; 11.5 miles are on Forest Service land.

Goose Creek (Table 13) **-** Habitat conditions in Goose Creek are fair to poor. There are higher than desirable road densities in the subwatershed, low number of full channel spanning pools, lower than desirable number of pieces of large wood, and high width to depth ratio in regard to the PACFISH RMO of < 10. However, the width to depth ratio is within the range of width to depth ratios described for Rosgen (1996) stream types. Goose Creek is a Rosgen B3 stream type. The Rosgen width to depth ratio for a Rosgen B3 stream type ranges from 11.7 to 38.0 and averages 18.8. There is a high percentage of stable streambanks. There are three fish barriers in the subwatershed, and are all culverts at road crossings. The Phillips Ditch, an irrigation ditch that originates from the West Fork of Eagle Creek, empties irrigation water into the East Fork and mainstem of Goose Creek.

Table 13. MIS habitat summary for Goose Creek		
Habitat Element	**Value**	**Rating**
Road Density (open and closed)	4.5 mi/mi^2 (subwatershed)	Not Properly Functioning
Stream Temperature	<64.4^{0}F (RMO value)	Functioning At Risk
Streambank Stability	>90% (RMO value)	Properly Functioning
Pool Frequency/Quality	56 pools/mi (RMO value)	Not Properly Functioning
Large Wood	>20 pcs/mi (RMO value)	Functioning At Risk
Riparian Zone Vegetation	Loss due to draw bottom roads	Functioning At Risk
Fish Barrier	Three culverts	Functioning At Risk

Habitat data from Big Creek and Goose Creek stream surveys show habitat in fair to poor condition. The amount of MIS habitat in these three subwatersheds represents a fraction of the overall miles of redband/rainbow trout MIS habitat verified on the Wallowa Whitman National Forest. There are 1,310 miles of redband/ rainbow trout MIS verified habitat on the Wallowa Whitman National Forest (Table 14). Based on GIS analysis of Region 6 fish distribution data, the amount of verified MIS habitat in the project area is 2.6% of the total miles verified on the Wallowa Whitman National Forest.

Table 14. MIS distribution in the project area in relation to the Wallowa-Whitman National Forest				
MIS	**Forest Distribution (mi)[1]**	**MIS in Analysis Area (mi) including non FS Acres**	**MIS in Analysis Area (mi) FS Acres only**	**Proportion of MIS habitat in Project Area out of total on Forest**
Redband Trout/ Rainbow Trout	1,310	43	34	2.6%
Steelhead	990	0	0	0%

[1]Miles calculated for the Wallowa-Whitman National Forest.

2.2 Effects Analysis

The Timber Canyon Alternative utility line would cross Big Creek and Goose Creek, both of which have redband trout. Potential effects to redband trout include increased solar radiation and decreased large woody debris recruitment from vegetation removal associated with clearing in the wire zone on Big Creek and Goose Creek, construction of access roads within RHCAs, particularly fish bearing streams that could increase sediment and reduce shade and large wood recruitment, and new or expanded road stream crossings, which could reduce streamside vegetation. Depending on the location, construction methods, extent of vegetation clearing and number and location of access roads there is potential for short and long term effects to MIS species and habitat. Potential effects would be mitigated by implementation of Design Feature 15 Reduce Impacts on Riparian Areas, Design Feature 16 Span Riparian Communities/Water Courses, and Design Feature 20 Reduce Potential for Aquatic Invasive Species (refer to Table 2-7 in Chapter 2).

Design features 15 and 16 should greatly minimize adverse effects to MIS species present in the Timber Canyon Alternative, redband trout. This MIS analysis assumes that activities that maintain and improve aquatic/riparian habitat will provide for redband trout/rainbow trout population viability on Wallowa-Whitman National Forest lands.

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APPENDIX F3
U.S. FOREST SERVICE WILDLIFE SENSITIVE SPECIES ANALYSIS

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U.S. Forest Service Wildlife Sensitive Species Analysis

Affected Environment

Segment 1—Morrow-Umatilla

Alternative Routes and Route Variations

The Applicant's Proposed Action and all alternative routes, as well as Variations S1-A1 and S1-A2, cross USFS-administered land in Segment 1. USFS-sensitive wildlife species that may occur on USFS-administered land in areas crossed by alternative routes in Segment 1 include American peregrine falcon, bald eagle, Lewis's woodpecker, white-headed woodpecker, fringed myotis, spotted bat, gray wolf, Intermountain sulphur, Johnson's hairstreak, and Western bumblebee (USFS 2013). Habitat descriptions for each of these species are provided in Appendix E—Supporting Data for Wildlife Resources. No American peregrine falcon or bald eagle nests are known to occur, although suitable nesting habitat may be present. Lewis's woodpecker and white-headed woodpecker are not known to occur, but they have been sighted in ponderosa pine forests along the Grande Ronde River in the Five Points-Grande Ronde watershed (USFS 2013). Gray wolf has not been documented on USFS-administered land in areas crossed by alternative routes, although there is potential for gray wolf to pass through these areas. No spotted bat or fringed myotis roost sites, hibernacula, or maternity colonies are known to occur, although the presence of ponderosa pine forest and permanent water indicate that potential habitat may exist (USFS 2013). Western bumblebee, Johnson's hairstreak, and Intermountain sulphur are not known to occur, although suitable habitat may be present (USFS 2013).

Segment 2—Blue Mountains

Alternative Routes and Route Variations

The Applicant's Proposed Action and all alternative routes, as well as Variations S2-A1 and S2-A2, cross USFS-administered land in Segment 2. USFS-sensitive wildlife species that may occur on USFS-administered land in areas crossed by alternative routes in Segment 2 include the species described for Segment 1, as similar habitat types are crossed by alternative routes in Segment 2. Additional species that may occur on USFS-administered land in areas crossed by alternative routes in Segment 2 include California floater, Columbia pebblesnail, and shortface lanx. These species are not known to occur on USFS-administered land in areas crossed by the alternative routes, although suitable habitat may be present where the alternative routes cross the Grande Ronde River.

Segment 3—Baker Valley

Alternative Routes and Route Variations

The Timber Canyon Alternative is the only alternative route that crosses USFS-administered land in Segment 3. USFS-sensitive wildlife species that may occur on USFS-administered land in areas crossed by the Timber Canyon Alternative include the species described for Segment 1, as similar habitat types are crossed by the Timber Canyon Alternative. Additional species that may occur on

USFS-administered land in areas crossed by the Timber Canyon Alternative include North American wolverine, Columbia Oregonian, blue mountainsnail, and shiny tightcoil (USFS 2013, Navarrete 2016). Habitat descriptions for each of these species are provided in Appendix E—Supporting Data for Wildlife Resources. No American peregrine falcon or bald eagle nests are known to occur, although suitable nesting habitat may be present. Lewis's woodpecker and white-headed woodpecker are not known to occur, but they have been sighted in the Eagle Creek watershed (USFS 2013). North American wolverine has been observed in the Eagle Creek watershed, a portion of which the Timber Canyon Alternative crosses (USFS 2013). Gray wolf has not been documented on USFS-administered land in areas crossed by the Timber Canyon Alternative, although there is potential for gray wolf to pass through these areas. No spotted bat or fringed myotis roost sites, hibernacula, or maternity colonies are known to occur, although the presence of ponderosa pine forest and permanent water indicate that potential habitat may exist (USFS 2013). Western bumblebee, Johnson's hairstreak, Intermountain sulphur, Columbia Oregonian, blue mountainsnail, and shiny tightcoil are not known to occur on USFS-administered land in areas crossed by the Timber Canyon Alternative, although suitable habitat may be present (USFS 2013, Navarrete 2016).

Environmental Consequences (Results of Analysis)

Segment 1—Morrow-Umatilla

Alternative Routes and Route Variations

No USFS-sensitive wildlife species are known to occur on USFS-administered lands in areas that would be crossed by any alternative route in Segment 1. However, there have been no historic surveys for USFS-sensitive wildlife species conducted along the alternative routes, so while there is no record of specific species locations, habitat for USFS-sensitive wildlife species is available and there is potential for these species to occur. The environmental consequence for each of the USFS-sensitive wildlife species that may occur on USFS-administered land in areas crossed by alternative routes in Segment 1 are described below.

American Peregrine Falcon, Bald Eagle, Lewis's Woodpecker, and White-Headed Woodpecker

Potential effects of the B2H Project on American peregrine falcon, bald eagle, Lewis's woodpecker, and white-headed woodpecker could include mortality, habitat loss or modification, habitat fragmentation, and noise and visual disturbance. Mortality could result from electrocution or collisions with the transmission line and other B2H Project features during the operation of the transmission line. Mortality and injury also could occur as a result of collision with vehicles or equipment during construction of the B2H Project.

Loss, modification, or fragmentation of the forested and riparian habitats used by peregrine falcon, bald eagle, Lewis's woodpecker and white-headed woodpecker as nesting and/or foraging habitat could occur as a result of removal of vegetation for the right-of-way, access roads, pads for transmission towers, and other B2H Project facilities. Removal of live trees and snags would affect both present and future nesting habitat.

Noise and visual disturbance from ground-clearing activities or increased noise and human presence during construction and maintenance activities in peregrine falcon, bald eagle, Lewis's woodpecker, and white-headed woodpecker habitat may cause behavioral disturbances resulting in displacement of individuals or abandonment of nesting habitat. Nesting birds are particularly sensitive to disturbance, and disturbance could lead to nest failure or abandonment. Noise during construction could affect peregrine falcon, bald eagle, Lewis's woodpecker, and white-headed woodpecker by masking auditory communication, such as individuals defending territory or trying to attract a mate, flock members making contact calls, nestlings begging for food, or alarm calls (Parris and Schneider 2008). These impacts could affect reproductive success or survival.

Design features of the B2H Project for environmental protection and selective mitigation measures would avoid and minimize impacts on individual American peregrine falcon, bald eagle, Lewis's woodpecker, and white-headed woodpecker and their habitat. The risk of mortality due to electrocution or collisions with the transmission line would be minimized through avian-safe design standards (Design Feature 12), while the risk of mortality due to collisions with vehicles and construction equipment would be minimized through limiting the extent of construction activities (Design Features 5 and 9) and enforcement of a speed limit (Design Feature 10). Loss, modification, and fragmentation of habitat would be minimized by limiting the extent of construction activities (Design Features 5 and 9), limiting the removal of trees and other vegetation (Selective Mitigation Measure 5), and reclamation (Design Feature 6). During the nesting season, migratory bird surveys would be conducted prior to any ground-disturbing activities (Design Feature 4). All construction personnel would be informed of the federal and state laws protecting migratory birds, the species' ecological importance, and reporting and stop-work procedures (Design Feature 2). Seasonal and spatial restrictions applied during the nesting season (Design Feature 11, Selective Mitigation Measure 12) are anticipated to minimize the effects of noise and visual disturbance on nesting birds. Disturbance during other times of the year would be minimized by limiting the extent of construction activities (Design Features 5 and 9). Behavioral modifications may occur, but they would be expected to be relatively minor. Refer to Tables 2-7 and 2-13 in Chapter 2 for a complete description of the design features of the B2H Project for environmental protection and selective mitigation measures.

Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project may impact individual American peregrine falcon, bald eagle, Lewis's woodpecker and white-headed woodpecker and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 1.

Fringed Myotis and Spotted Bat

Potential effects of the B2H Project on fringed myotis and spotted bat include mortality, habitat loss or modification, habitat fragmentation, and noise and visual disturbance. Fringed myotis and spotted bat mortality could result from electrocution or collisions with the transmission line and other B2H Project

features during the operation of the transmission line. Mortality and injury also could occur as a result of collision with vehicles or equipment during construction of the B2H Project.

Loss, modification, and fragmentation of the forest canopies, shrublands, and grasslands used by fringed myotis and spotted bat as foraging habitat could occur as a result of removal of vegetation for the right-of-way, access roads, pads for transmission towers, and other B2H Project facilities. Potential roosting habitat is anticipated to be largely avoided by B2H Project activities, as the steep cliffs, rock walls, and caves that provide most suitable roosting sites physically would prevent B2H Project activities from occurring in proximity to these types of roosting habitat. However, live trees or snags used for roosting could be damaged or removed as a result of construction and maintenance activities.

Noise and visual disturbance from ground-clearing activities or increased noise and human presence during construction and maintenance activities in fringed myotis and spotted bat roosting and foraging habitat may cause behavioral disturbances resulting in displacement of individuals or abandonment of daytime roosts, hibernacula, or maternity colonies.

Design features of the B2H Project for environmental protection and selective mitigation measures would avoid and minimize impacts on individual fringed myotis and spotted bats and their habitat. During the nesting season, migratory bird surveys would be conducted prior to any ground-disturbing activities (Design Feature 4). Despite being focused on bird species, these surveys could identify potential roosts in the B2H Project area and be used to create seasonal and avoidance restrictions and inform construction monitoring requirements. All construction personnel would be informed of the federal and state laws protecting fringed myotis and spotted bat, the species' ecological importance, and reporting and stop-work procedures (Design Feature 2). Loss or modification of habitat would be minimized by limiting the extent of construction activities (Design Features 5 and 9), limiting the removal of trees and other vegetation (Selective Mitigation Measure 5), and reclamation (Design Feature 6). Impacts from noise and visual disturbance would be temporary and localized in nature and would be minimized by limiting the extent of construction activities (Design Features 5 and 9). The risk of mortality due to electrocution or collisions with the transmission line would be minimized through avian-safe design standards (Design Feature 12), while the risk of mortality due to collisions with vehicles or equipment during construction of the B2H Project would be minimized through limiting the extent of construction activities (Design Features 5 and 9) and enforcing a speed limit (Design Feature 10). Refer to Tables 2-7 and 2-13 in Chapter 2 for a complete description of the design features of the B2H Project for environmental protection and selective mitigation measures.

Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project may impact individual fringed myotis or spotted bats and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 1.

Gray Wolf

Gray wolf has not been documented on USFS-administered land in areas crossed by alternative routes in Segment 1, although there is potential for gray wolf to disperse through these areas. Potential direct effects of the B2H Project on gray wolf may include habitat displacement, degradation, and fragmentation; disturbance; and injury or mortality. If gray wolves disperse through the B2H Project area, human presence, noise, and vehicle use associated with B2H Project construction and maintenance activities could increase the potential for disturbance and vehicle mortality. Potential indirect effects of the B2H Project on gray wolves could include increased disturbance and mortality associated with increased human access and activity (e.g., increased illegal hunting of gray wolves) and periodic disturbance and noise associated with vehicle use and human presence during maintenance activities after construction.

Direct effects on dispersing gray wolves would be greatest during the construction phase of the B2H Project, when human presence, noise, and vehicle use would be substantially greater than during other phases of the B2H Project. Following construction, effects would be limited to periodic disturbance and noise associated with vehicle use and human presence during maintenance activities, including inspections, repairs, and vegetation management; avoidance; and increased illegal hunting due to new access roads created for the B2H Project.

Design features of the B2H Project for environmental protection and selective mitigation measures would minimize gray wolf habitat displacement, degradation, and fragmentation. The extent of construction activities would be limited (Design Features 5 and 9), the removal of trees and other vegetation would be limited (Selective Mitigation Measure 5), a Noxious Weed Management Plan would be implemented (Design Feature 1), and reclamation activities would occur (Design Feature 6). Limiting the extent of construction activities and the removal of trees and other vegetation also may minimize avoidance of the areas disturbed by the B2H Project by gray wolf. Mortality from vehicle collisions is unlikely due to limiting the extent of construction activities and enforcing a speed limit (Design Feature 10). Increased disturbance and mortality associated with recreational use of access roads and maintenance could occur but is unlikely due to limited public accessibility of new or improved access roads (Selective Mitigation Measure 6). Refer to Tables 2-7 and 2-13 in Chapter 2 for a complete description of the design features of the B2H Project for environmental protection and selective mitigation measures.

Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project may impact individual gray wolves and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 1.

Intermountain Sulphur, Johnson’s Hairstreak, and Western Bumblebee

Potential effects of the B2H Project on Intermountain sulphur, Johnson’s hairstreak, and Western bumblebee include mortality, habitat loss or modification, and habitat fragmentation. Mortality of these species could result from collision with vehicles or equipment during construction of the B2H Project.

Loss, modification, and fragmentation of habitat used by Intermountain sulphur, Johnson's hairstreak, and Western bumblebee would occur as a result of removal of vegetation in suitable habitat for access roads, pads for transmission towers, and other B2H Project facilities. Long-term habitat loss for Johnson's hairstreak would also occur in the 250-ft right-of-way in areas where the B2H Project crosses suitable habitat, as this species typically spends much of its time in the top of the forest canopy (USFS 2013). The right-of-way would be cleared of trees and maintained to consist of low-growing vegetation. Intermountain sulphur and Western bumble bee typically inhabit open habitat types with lower-growing vegetation that may not require vegetation clearing for the right-of-way, but habitat modification could occur if B2H Project activities result in the establishment and spread of non-native plants that alter the abundance of host, pollen, or nectar plants.

Design features of the B2H Project for environmental protection and selective mitigation measures would avoid and minimize impacts on individual Intermountain sulphur, Johnson's hairstreak, and Western bumblebee and their habitat. Loss, modification, and fragmentation of habitat would be minimized by limiting the extent of construction activities (Design Features 5 and 9), limiting the removal of trees and other vegetation (Selective Mitigation Measure 5), and implementing reclamation activities (Design Feature 6). The risk of mortality due to collision with vehicles or equipment during construction of the B2H Project would be minimized through limiting the extent of construction activities (Design Features 5 and 9). Refer to Tables 2-7 and 2-13 in Chapter 2 for a complete description of the design features of the B2H Project for environmental protection and selective mitigation measures.

Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project may impact individual Intermountain sulphur, Johnson's hairstreak, and Western bumblebee and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 1.

Segment 2—Blue Mountains

Alternative Routes and Route Variations

No USFS-sensitive wildlife species are known to occur on USFS-administered lands in areas that would be crossed by any alternative route in Segment 2. However, there have been no historic surveys for USFS-sensitive wildlife species conducted along the alternative routes, so while there is no record of specific species locations, habitat for USFS-sensitive wildlife species is available and there is potential for these species to occur. The environmental consequences for each of the USFS-sensitive wildlife species that may occur on USFS-administered land in areas crossed by alternative routes in Segment 2 are described below.

American Peregrine Falcon, Bald Eagle, Lewis's Woodpecker and White-Headed Woodpecker

Potential effects of the B2H Project on American peregrine falcon, bald eagle, Lewis's woodpecker and white-headed woodpecker would be similar to those described for Segment 1 as the same habitat types would be crossed in Segment 2. The same design features of the B2H Project for environmental

protection and selective mitigation measures to avoid and minimize impacts on individual American peregrine falcon, bald eagle, Lewis's woodpecker, and white-headed woodpecker and their habitat would be applied in Segment 2 as described for Segment 1. Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project, may impact individual American peregrine falcon, bald eagle, Lewis's woodpecker and white-headed woodpecker and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 2.

Fringed Myotis and Spotted Bat

Potential effects of the B2H Project on fringed myotis and spotted bat would be similar to the effects described for Segment 1, as the same habitat types would be crossed in Segment 2. The same design features of the B2H Project for environmental protection and selective mitigation measures to avoid and minimize impacts on individual fringed myotis and spotted bat and their habitat would be applied in Segment 2 as described for Segment 1. Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project may impact individual fringed myotis and spotted bat and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 2.

Gray Wolf

Potential effects of the B2H Project on gray wolf would be similar to the effects described for Segment 1, as the same habitat types would be crossed in Segment 2. The same design features of the B2H Project for environmental protection and selective mitigation measures to avoid and minimize impacts on individual gray wolves and their habitat would be applied in Segment 2 as described for Segment 1. Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project may affect individual gray wolves and their habitat, but it likely will not contribute to a trend toward federal listing or cause a loss of viability to the populations or species in Segment 2.

Intermountain Sulphur, Johnson's Hairstreak, and Western Bumblebee

Potential effects of the B2H Project on Intermountain sulphur, Johnson's hairstreak, and Western bumblebee would be similar to the effects described for Segment 1, as the same habitat types would be crossed in Segment 2. The same design features of the B2H Project for environmental protection and selective mitigation measures to avoid and minimize impacts on individual Intermountain sulphur, Johnson's hairstreak, and Western bumblebee and their habitat would be applied in Segment 2 as described for Segment 1. Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project, may impact individual Intermountain sulphur, Johnson's hairstreak, and Western bumblebee and their

habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 2.

California Floater, Columbia Pebblesnail, and Shortface Lanx

Potential effects of the B2H Project on California floater, Columbia pebblesnail, and shortface lanx could include habitat modification. All of these aquatic mollusks are associated with large rivers and tributaries; therefore, suitable habitat may be present where alternative routes cross the Grande Ronde River.

The Grande Ronde River would be spanned by the transmission line, and no in-water work, or work below the ordinary high water mark, would occur in the Grande Ronde River. Also, no new crossings, or modifications of existing crossings below the ordinary high water mark, would occur within 1,000 feet upstream of the transmission line crossing of the Grande Ronde River. Modification of California floater, Columbia pebblesnail, and shortface lanx habitat could occur as a result of reductions in water quality associated with removal of vegetation in the right-of-way adjacent to the Grande Ronde River and accidental spills and leaks of hazardous materials. Long-term loss of vegetation and trees near streams may cause an increase in solar exposure and a slight localized increase in surface water temperature. Thinning or removal of vegetation within or adjacent to riparian areas also could contribute to long-term local increases in sedimentation. Temporary increases in turbidity and sedimentation also could occur due to long-term periodic operation and maintenance activities near the Grande Ronde River.

Design features of the B2H Project for environmental protection and selective mitigation measures would avoid and minimize impacts on individual California floater, Columbia pebblesnail, and shortface lanx and their habitat. Degradation of water quality due to increases in surface water temperature, sedimentation, and turbidity would be minimized though the avoidance and spanning of riparian areas and aquatic habitats (Design Feature 15, Selective Mitigation Measure 8), limiting the spatial extent of construction activities and access roads (Design Features 5 and 9, Selective Mitigation Measures 1, 2, and 4), minimizing vegetation removal (Selective Mitigation Measure 5), implementing reclamation activities (Design Feature 6), and using other best management practices (refer to Design Features 17, 18, and 19), although some minor effects may still occur. Short-term reductions in water quality due to accidental spills and leaks of hazardous materials would be minimized through proper containment of hazardous materials (Design Feature 21) and implementation of herbicide buffers contained in the Noxious Weed Management Plan (Design Feature 1).

Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project may impact individual California floater, Columbia pebblesnail, and shortface lanx and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 2.

Segment 3—Baker Valley

Alternative Routes and Route Variations

No USFS-sensitive wildlife species are known to occur on USFS-administered lands in areas that would be crossed by the Timber Canyon Alternative. However, there have been no historic surveys for USFS-sensitive wildlife species conducted along the alternative route, so while there is no record of specific species locations, habitat for USFS-sensitive wildlife species is available and there is potential for these species to occur. The environmental consequences for each of the USFS-sensitive wildlife species that may occur on USFS-administered land in areas crossed by the Timber Canyon Alternative in Segment 3 are described below.

American Peregrine Falcon, Bald Eagle, Lewis's Woodpecker, and White-Headed Woodpecker

Potential effects of the B2H Project on American peregrine falcon, bald eagle, Lewis's woodpecker, and white-headed woodpecker would be similar to the effects described for Segment 1, as the same habitat types would be crossed in Segment 3. The same design features of the B2H Project for environmental protection and selective mitigation measures to avoid and minimize impacts on individual American peregrine falcon, bald eagle, Lewis's woodpecker, and white-headed woodpecker and their habitat would be applied in Segment 3 as described for Segment 1. Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project may impact individual American peregrine falcon, bald eagle, Lewis's woodpecker and white-headed woodpecker and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 3.

Fringed Myotis and Spotted Bat

Potential effects of the B2H Project on fringed myotis and spotted bat would be similar to those described for Segment 1, as the same habitat types would be crossed in Segment 3. The same design features of the B2H Project for environmental protection and selective mitigation measures to avoid and minimize impacts on individual fringed myotis and spotted bat and habitat would be applied in Segment 3 as described for Segment 1. Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project may impact individual fringed myotis and spotted bat and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 3.

Gray Wolf

Potential effects of the B2H Project on gray wolf would be similar to the effects described for Segment 1, as the same habitat types would be crossed in Segment 3. The same design features of the B2H Project for environmental protection and selective mitigation measures to avoid and minimize impacts on individual gray wolves and habitat would be applied in Segment 3 as described for Segment 1. Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would

avoid and minimize impacts, implementation of the B2H Project may impact individual gray wolves and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 3.

North American Wolverine

North American wolverine has not been documented on USFS-administered land in areas crossed by the Timber Canyon Alternative in Segment 3, although a wolverine has been observed in the West Eagle Meadow campground (USFS 2013), approximately 6 miles from the Timber Canyon Alternative. Characteristic habitat for North American wolverine (i.e., high elevation, conifer forest with open rocky slopes surrounded by or adjacent to high elevation forested habitat for denning) would not be crossed by the B2H Project, although there is potential for North American wolverine to disperse through the B2H Project area.

Potential direct effects of the B2H Project on North American wolverine may include habitat displacement or disturbance, and injury or mortality. If North American wolverines disperse through the B2H Project area, human presence, noise, and vehicle use associated with B2H Project construction and maintenance activities could increase the potential for disturbance and vehicle mortality. Potential indirect effects of the B2H Project on North American wolverine could include periodic disturbance and noise associated with vehicle use and human presence during maintenance activities after construction.

Direct effects on dispersing North American wolverine would be greatest during the construction phases of the B2H Project, when human presence, noise, and vehicle use would be substantially greater than during other phases of the B2H Project. Following construction, effects would be limited to periodic disturbance and noise associated with vehicle use and human presence during maintenance activities, including inspections, repairs, and vegetation management.

Design features of the B2H Project for environmental protection and selective mitigation measures would minimize North American wolverine habitat displacement by limiting the extent of construction activities (Design Features 5 and 9), limiting the removal of trees and other vegetation (Selective Mitigation Measure 5), implementing the Noxious Weed Management Plan (Design Feature 1), and implementing reclamation activities (Design Feature 6). Limiting the extent of construction activities and the removal of trees and other vegetation also may minimize North American wolverine avoidance of the areas disturbed by the B2H Project. Mortality from vehicle collisions is unlikely due to limiting the extent of construction activities and enforcing a speed limit (Design Feature 10). Increased disturbance and mortality associated with B2H Project maintenance could occur, but it is unlikely due to limited public accessibility of new or improved access roads (Selective Mitigation Measure 6). Refer to Tables 2-7 and 2-13 in Chapter 2 for a complete description of the design features of the B2H Project for environmental protection and selective mitigation measures.

Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project may impact individual North

American wolverine and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 3.

Intermountain Sulphur, Johnson's Hairstreak, and Western Bumblebee

Potential effects of the B2H Project on Intermountain sulphur, Johnson's hairstreak, and Western bumblebee would be similar to the effects described for Segment 1, as the same habitat types would be crossed in Segment 3. The same design features of the B2H Project for environmental protection and selective mitigation measures to avoid and minimize impacts on individual Intermountain sulphur, Johnson's hairstreak, and Western bumblebee and their habitat would be applied in Segment 3 as described for Segment 1. Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project may impact individual Intermountain sulphur, Johnson's hairstreak, and Western bumblebee and their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 3.

Columbia Oregonian, Blue Mountainsnail, and Shiny Tightcoil

Potential effects of the B2H Project on Columbia Oregonian, blue mountainsnail, and shiny tightcoil include mortality, habitat loss or modification, and habitat fragmentation. Mortality of these species could result from collision with vehicles or equipment used during the construction phase of the B2H Project.

Loss, modification, and fragmentation of Columbia Oregonian, blue mountainsnail, and shiny tightcoil habitat could occur as a result of removal of vegetation in suitable habitat for access roads, pads for transmission towers, and other B2H Project facilities. Long-term habitat loss also could occur in the 250-ft right-of-way in areas where the B2H Project crosses suitable habitat. These species typically occur in old growth or intact forests, and the right-of-way would be cleared of trees and would be maintained to consist of low-growing vegetation. Suitable habitat adjacent to the right-of-way also could be modified as a result of right-of-way vegetation clearing. In addition to other habitat characteristics, Columbia Oregonian, blue mountainsnail, and shiny tightcoil are dependent on a stable microclimate, shadiness, and humidity. Suitable habitat adjacent to the right-of-way could be subjected to increased temperatures and reduced shading and humidity. These habitat dependences, coupled with limited mobility with which to escape unfavorable conditions, suggest that loss, modification, and fragmentation of suitable habitat, and associated microhabitat changes, would negatively affect Columbia Oregonian, blue mountainsnail, and shiny tightcoil and habitat if present near or adjacent to B2H Project activities.

Design features of the B2H Project for environmental protection and selective mitigation measures would avoid and minimize impacts on individual Columbia Oregonian, blue mountainsnail, and shiny tightcoil and their habitat. Loss, modification, and fragmentation of habitat would be minimized by limiting the extent of construction activities (Design Features 5 and 9), limiting the removal of trees and other vegetation (Selective Mitigation Measure 5), and implementing reclamation activities (Design Feature 6). The risk of mortality due to collisions with construction equipment or vehicles would be minimized through limiting the extent of construction activities (Design Features 5 and 9). Refer to

Tables 2-7 and 2-13 in Chapter 2 for a complete description of the design features of the B2H Project for environmental protection and selective mitigation measures.

Due to the limited extent of the B2H Project on lands under USFS jurisdiction and the application of design features of the B2H Project for environmental protection and selective mitigation measures that would avoid and minimize impacts, implementation of the B2H Project may impact individual Columbia Oregonian, blue mountainsnail, and shiny tightcoil or their habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species in Segment 3.

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